Railway Age

Vol. 80 June 12, 1926 No. 31

Train Load of Tungsten Ore Valued at $500,000 Handled from Weehawken, N. J., to Niagara Falls by the New York Central for the Crucible Steel Company

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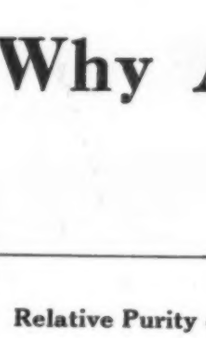

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Railway Age

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What Is a Minor Defect?

THE railroads as a whole are making marked progress toward higher standards of locomotive maintenance, a progress desirable primarily from the point of view of safety to railroad employees and patrons. An important by-product which should not be overlooked, however, is the increased serviceability obtainable from motive power. The general reduction in engine failures causing train delays and the increase in individual locomotive mileage per day and month reflect in no uncertain manner improved locomotive conditions. One of the best indications of a general tightening up in locomotive maintenance methods is obtainable from figures compiled by the Bureau of Locomotive Inspection, which show a steady decrease in the percentage of locomotives examined by the bureau's inspectors and found defective, from 65 per cent in 1923, to 53 per cent in 1924, and 46 per cent in 1925. A somewhat larger total number of locomotives was inspected each year and in 1925 this figure reached 72,279. Among the defects which go to swell the totals reported by the bureau are many locomotive parts "defective, inoperative, or missing," which to the laymen, and sometimes possibly to experienced railroad men, appear of *minor* importance. The difficulty of deciding what type of defect to place in this class, however, may be inferred from the fact that in 1925 the condition of brake rigging, possibly in some cases simply the omission of a split key, caused 31 accidents, 3 of which led to fatalities. Grate shakers caused 57 accidents, hand holds 13, squirt hose 53, and springs and spring rigging 25, one of which resulted in a fatality. The safe practice is to consider no defects *minor* in importance, but, by an organized attempt to eliminate them all, secure a maintenance standard as closely as possible approximating 100 per cent.

Who Pays?

IN 1923, according to figures compiled by the Bureau of Railway Economics, the Class I railways of the United States purchased 113,907,000 cross ties. A year later they bought 98,130,000 ties and in 1925, 87,964,517. Thus, in the latter year they bought 25,942,483 less ties than two years previously, a reduction of 23 per cent. While this fluctuation is not as wide as in the purchase of some other railway materials, it is nevertheless of far reaching effect on the tie producing industry and hence on the railways which offer the sole market for that industry. Twenty-five million ties is a lot of ties and a reduction in purchases of that amount in as short a period as two years cannot help but lead to serious disorganization in the industry. A large proportion of the ties produced are hewn and when the market for their product disappears, the tie hewers must look elsewhere for employment with the result that when the railways again return to the market the production is stimulated only after a considerable interval of time and by the offer of higher prices. With the increasing use of treated ties, the evil of fluctuations of this character are accentuated for ties must be produced and purchased further in advance of their use in order to permit them to be seasoned and treated properly. The tendency, however, still prevails for the roads to rush into the market at the last minute when in need of ties, pay unnecessarily high prices and at the same time accept those which are available even though they are not up to the specifications and then to treat them when insufficiently seasoned. There is no material used by the railways in which orderly buying year after year will yield as large a return as ties. It is only by such a policy, supplemented by the protection of the ties after treatment, by the use of tie plates, etc., to enable them to render the maximum service after their insertion in the track, that the renewals can be brought to and held at the low point of 100 to 125 ties per mile of track, now reached by several roads. The number of roads that are still required to renew from 250 to 300 ties per mile of track is ample evidence of the fact that much yet remains to be done.

Who Instructs Your Men in "Safety First"?

IF any division engineer, trainmaster, road foreman of engines, master mechanic or master car builder has the least doubt as to who is responsible for teaching the men in his department the rules to be observed in order best to safeguard their own lives and limbs, he will do well to get the proceedings of the recent St. Louis meeting of the Safety Section, and read the four resolutions, introduced by Thomas H. Carrow, chairman of the Section, calling upon the heads of the four departments (indicated by the titles just mentioned) to take definite measures to enlighten their men as to the practical meaning of the "35 per cent reduction in casualties" which the Safety Section sets as the goal of its six-year campaign. One of these resolutions was reprinted in last week's issue of the *Railway Age*. Enthusiasm in taking a vote at a convention is not, of course, the same thing—or even the same kind of thing—as patient persistence in carrying out the purpose of the resolutions in everyday life; but thought must precede acts, and in this case the thought is expressed in peculiarly terse style. Moreover, Mr. Carrow evidently is determined to have the resolutions of the safety specialists made the resolution of each individual general manager. This is as it should be; for the problem in hand is a complicated one, and the signature of the highest operating officer is the proper one to attach to it. Many officers of various grades are still more or less obsessed with the feeling that the problem is not merely a complicated one, but in some of its features an impossible one. Nothing less than the utmost energy and aggressiveness will suffice to reach the goal. Railroaders who aim only to "prevent accidents" are in the mental attitude

of the steamboat pilot who keeps his mind constantly anxious as to the location of each one of the hundreds of rocks or shoals that lie along the sides of the channel that he is navigating; whereas his true function is to keep his eyes constantly on the landmarks which tell him *where the safe channel is*. Constantly correcting the course in this way, may be a severer strain on the mental faculties than to study the rocks, but it is the true way. Likewise the railroad man; "patient continuance in well-doing" may be tedious, even burdensome, but it is a normal activity; while to study the monthly or annual statistics of persons killed and injured, or to listen to a safety lecture, is only an indirect way of cultivating carefulness. Mr. Carrow aims always at something constructive. Each one of his four resolutions states, under "the human factor," as the first means to be employed, "Improved training, supervision and discipline." No amount of discussion can take the place of this.

Inconsistencies of Our Transportation Policy

FEW better examples of inconsistency and even stupidity in public affairs could be cited than the past and present policy of government in the United States regarding transportation in its various branches. We have three important means of transportation—by railway, by water and by motor vehicles on highways. The Transportation Act announces a policy for dealing with railways, but although that law has been in effect six years the railway policy enunciated in it, especially regarding rate-making, has been only very incompletely carried out. It enunciates a policy regarding both rail and water transportation and the relations between them, but that policy has hardly been carried out at all. The entire policy enunciated regarding the railways is based upon one fundamental assumption; and the policies followed regarding other means of transportation are intended mainly to prevent the assumption upon which railway regulation is so largely based from being true. The anarchy that prevails in our government's policies in dealing with transportation is due to an almost complete lack of co-ordination of the thought, purposes and activities of those who make these policies.

The important assumption above referred to upon which our policy of railway regulation is very largely based is that railway transportation is, and should be, monopolistic in its nature. Excepting upon this assumption there would be no more economic warrant for regulating railway rates than for regulating the prices of food or coal. The Interstate Commerce Commission and state commissions are authorized to refuse certificates of public convenience for the construction of new railway mileage, the purpose being to prevent the building of parallel and competing railway lines upon the theory that thus economic waste will be avoided for which the public would have to pay in rates. Regulation of rates results in limitation of the profits that railways may earn, but the Transportation Act announces it as the government's policy to cause adequate development of facilities of rail transportation, and to this end directs rates to be so adjusted as to enable each large territorial group of railways to earn a fair return.

Having thus treated railway transportation as monopolistic in its nature, the federal government lets ships use the Panama Canal in direct competition with the railways for tolls that are non-compensatory to the government; lets the ships charge rates that are not published and that are discriminatory as between shippers, while prohibiting the railways from doing so; and, finally, prohibits the railways from meeting the competition of the ships by making rates that are lower to points where there is water competition that where there is not.

The government develops other waterways, such as rivers and canals, to compete with the railways, and there is being carried on an extensive propaganda for an enlargement of this policy by the expenditure of vast sums upon such projects as the Great Lakes-St. Lawrence waterway, the Lakes-to-the-Gulf waterway and the improvement of the Missouri river. In other words, parallel and competitive railway construction is now prevented by the government as contrary to the public interest because causing economic waste; while parallel and competitive waterway construction is carried on by the government itself and is advocated on a largely increased scale.

The advocacy of extensive inland waterway development is based upon the grounds, first, that it is needed to "relieve" the railways, and, secondly, that water transportation is cheaper than rail. The first ground is wholly untenable, because there is no limit to the extent to which the capacity of the railways can be enlarged. As to the second ground, the experience of neither this nor any other country supports the view that the total economic cost of transportation by river or canal is or can be made less than it is by rail in the United States. The government's own principal authority on railroad transportation is the Interstate Commerce Commission, upon which it has imposed the responsibility of so regulating the railways as to promote efficient, economical and adequate rail transportation. The Transportation Act, with the administration of which the Interstate Commerce Commission is charged, declares it to be the policy of Congress to keep rail and water transportation in equal efficiency and vigor. And yet never has Congress or any executive officer of the government asked the commission for its views regarding the desirability of any waterway project, and especially whether in its opinion the total cost of transportation on any waterway is or would be greater or less than by rail. In legislating regarding waterways Congress relies for its information as to their desirability, whether to relieve or compete with the railways, entirely upon persons who obviously have made no impartial, scientific study of the economics of water and rail transportation, and who either have political axes to grind or are trying to promote their real or supposed business interests at the expense of the general taxpayer. In consequence, we have a national policy that prevents competitive railway construction, and the resulting economic waste, and another national policy that promotes competitive development of waterways with railways without any real investigation and regardless of the economic waste that may result.

Very much the same thing has been true of the construction of highways. No railway would now be allowed to build a new line directly paralleling and competitive with a line of another railway; but the favorite routes for the construction of main trunk highways all over the country have been directly parallel with the railways. Once they have been built, active competition of trucks and buses with the railways usually has begun at once, and in many cases without any consideration on the part of public or public authorities of whether traffic was being diverted from the railways in circumstances that would inevitably increase the total cost of transportation to the public without any corresponding increase or improvement in the service rendered.

One fact of the greatest importance which apparently

is not recognized or is constantly overlooked by those who foster the development of other means of transportation in competition with the railways is that, excepting some short haul traffic in congested areas, it is impossible to take a passenger or a ton of freight from the railways without making greater than it otherwise would be the cost incurred by them in hauling all their remaining passengers and freight. This is due to the fact that usually the denser a railway's traffic becomes the lower is the operating cost per unit of traffic at which it can handle it—provided, of course, it is financially able to expand its facilities enough to keep them adequate to the demands upon them. It follows that every measure that is adopted or practice that is encouraged by government that diverts from the railways traffic that otherwise would be handled by them tends to make railway rates higher than they otherwise would be. It is probable that if the western railways had at present all the traffic they could handle they would not need an advance in rates; and an important reason why they have less traffic than six years ago is that so much of what they formerly had has been diverted to the Panama Canal. The railways are still, and will be indefinitely, not only the backbone but most of the skeleton of the country's entire transportation system. We hear much of the savings to shippers through lower freight rates that have been and may be effected by the development of waterways. But the taxpayers have paid, and are still paying and must continue to pay for waterways. Furthermore, the waterways have been and will be the cause of many millions of dollars of concealed losses annually due to the diversion of traffic from the railways and the consequent higher costs of all rail transportation than would otherwise be necessary. If all the factors could be and were considered it seems not improbable it would be found that in this and every other country since the development of railways government improvement of rivers and canals has directly and indirectly cost the public many times as much as it has saved it.

It has been said many times, and there has never been any dissent from the proposition, that the United States needs a transportation policy under which the development and operation of railways, waterways and highways will be so co-ordinated that traffic between any given points or territories will be handled by that means of transportation by which it can be handled most economically in proportion to the quality of the service rendered. The country has no such policy now. It has several different wholly inconsistent policies that are predicated upon assumptions that directly conflict and many of which are baseless. The main trouble is that politics usually has the stellar role in our government transportation drama, while sound economic principles are given very minor roles and seldom allowed to come upon the stage.

There is one way, it would appear, in which the situation might be greatly improved. The Interstate Commerce Commission is the government's expert agency for regulating railroad transportation. The commission's duties and authority should be enlarged to embrace other forms of transportation. To it should be referred for investigation and recommendation all projects for the development of inland waterways. It should be given authority to regulate the rates of all coastwise and inland carriers by water and of all interstate common carriers by highway. It should be charged to so regulate the rates of all coastwise and interstate common carriers, whether by water, rail or highway, that there will be no unfair competition between them, the object being to cause all traffic to be handled in those ways that will be most economically beneficial to the public.

Until the transportation policy of the government is dictated less by politics, and is formulated mainly by some impartial and expert body that will give the subject real study in the light of sound economic principles, it will continue to be a jumble of inconsistencies unworthy of an intelligent people and a cause of enormous waste for which the public will have to pay heavily in taxes and in freight and passenger rates.

More College Men Getting Higher Railway Positions

PRESIDENT LOWELL of Harvard University is reported to have said in a recent address in Chicago that the time has passed in America when men can rise to positions of leadership without a college education. An interesting test of the warrant for this statement may be made by considering to what extent it is supported by the education received by men who have, within recent years, been elected to the presidencies of our railways, as compared with the education received by their predecessors.

Within the last four years thirteen of our important railway companies have elected new presidents. These are the New York Central, Pennsylvania, Delaware, Lackawanna & Western, Chicago & Eastern Illinois, Norfolk & Western, Central of Georgia, Louisville & Nashville, Chicago & North Western, Denver & Rio Grande Western, Missouri Pacific, Missouri-Kansas-Texas, Minneapolis, St. Paul and Sault Ste. Marie and Chicago Great Western. Of the retiring presidents of these railways only two were college educated men, while eleven were non-college men. On the other hand, of the thirteen new presidents, seven are college men and only six are are non-college men.

It may be worth while to mention the schools at which the college men were educated. They are Yale University, President Atterbury of the Pennsylvania; Swarthmore College, President Needles of the Norfolk & Western; Purdue University, President Downs of the Central of Georgia; Vanderbilt University, President Cole of the Louisville & Nashville; University of Iowa, President Sargent of the North Western; Lehigh University, President Baldwin of the Missouri Pacific; West Point Military Academy, President Howard of the Chicago Great Western. A majority of these men were educated as engineers.

The facts given indicate that the chance of the non-college man to rise to the top in the railroad business is declining, while that of the college man is increasing. There are, of course, among all the employees and officers of railways many more non-college than college men, but in spite of this the number of college man who are rising to the highest positions is now equalling or exceeding the number of non-college men.

It will be noted, however, that the non-college railway man still has his chance. What the facts actually show is not that a man, to rise to a high position on a railroad, must be college educated, but that there is a growing demand that he shall be broadly educated. No board of directors in electing a president ever considers whether he went to college or not. It simply considers whether he is the best qualified man available. The same thing is true of a railroad management when it is considering who shall be promoted. The number of college men being promoted to high positions is gaining on the number of non-college men simply because a relatively larger number of college men are being found qualified for promotion.

No young man of ability and ambition who has entered

railway service without a college education need be discouraged for that reason. A man does not have to go to college to get an education good enough to fit him for advancement to a high position in industry or in most professions. There are many railroad men who have become well and broadly educated without ever entering a college. But they did not become educated merely by experience in doing daily the work to which somebody else assigned them. They became educated by hard study outside of their regular working hours which broadened their knowledge, and by deliberate effort, both outside and inside their regular working hours, to increase the strength and range of their mental powers.

If one man goes to work for a railroad when another enters college, each of them, when the latter graduates, will have some advantages over the other. The former will have the advantage of experience, the latter the advantage of intensive study and mental training. The disadvantage of lack of experience is, however, much more easily overcome than the disadvantage of lack of study and mental training. Therefore, if the non-college man wants to beat the college man in the race he will have to rely not merely upon his greater experience, but also upon hard study and mental discipline undertaken and carried on expressly to compensate for the lack of college training.

Signals Versus Train Control

ALTHOUGH 197,787 miles of road and 232,000 miles of track are operated in passenger service in the United States, only 43,839 miles of road and 69,128 miles of tracks are yet equipped with automatic signals. This mileage represents 30 per cent of the total track mileage, including the lines with the heaviest and fastest passenger traffic. In addition, approximately 1,945 miles of tracks are protected by controlled-manual block signaling while manual block signaling is used on 70,290 miles of additional tracks and no block system is used on 39 per cent of the track mileage, comprising lines of comparatively light traffic.

In an address before the American Institute of Electrical Engineers recently, A. H. Rudd, chief signal engineer of the Pennsylvania, stated that in 1923 and 1924 less than 5 per cent of the collisions occurred on the 30 per cent of the mileage protection by automatic signals and carrying the heaviest traffic, while 64 per cent of the accidents occurred on the 39 per cent of tracks without a block system and handling the lightest traffic. Further in 1923, 28-1/3 per cent, and in 1924, 34 per cent of the collisions occurred in the so-called manual block territory. An analysis of these figures indicates that the rules governing block operations are lax on many lines as 70 per cent of these collisions in 1923 and 63 per cent in 1924 were head-on, due to the over-running of meeting points, few if any of which would have occurred if an absolute block had been enforced for opposing trains.

Automatic signals have demonstrated their value in increasing track capacity and safety to such an extent that many roads are making extensive installations. However, the accident record shows that others are securing needed track capacity in busy seasons only by lessening the protective restrictions under the manual block.

In its recent decision authorizing the Missouri Pacific to postpone indefinitely its date of compliance with the second train control order, the Interstate Commerce Commission has recognized the contribution which that road in making to the improvement of its safety of train operation by its extensive signal program. The law gives the commission the authority to order automatic train stops, automatic train control or other safety devices. Under the order may be included automatic signals. The example being set by the Missouri Pacific with 391 miles of signaling now under construction is worthy of attention. The commission is also to be commended for its recognition of the value of this program in furthering safety of train operation—the objective of train control itself.

The Railroads and the City Beautiful

THE railways are the great highways of commerce and as such their terminals comprise the primary gateways of cities, great and small. Therefore the traveler on a passenger train receives his first and often his only impression of a city from what he sees from the coach window or the observation platform and it must be admitted that what he is able to see within yard limits is not usually of such a nature as to appeal to his sense of the aesthetic.

The reason for this is obvious. Barring a few exceptions, the rights-of-way occupied by passenger tracks are not like a boulevard restricted exclusively to passenger vehicles. Instead, they are used as well for freight and switching movements and in the interest of mutual advantage of carrier and shipper, they are bordered by factories, storage yards and warehouses. In their own interest also the railroads must assign large areas to classification yards, storage tracks, freight stations and engine terminals. The result is that a ride into a great city is not like one through a series of city parks, for even where the view may be a pleasing one, it is not infrequently cut off by a string of box cars.

This condition is now one focus of attack by the advocates of the "city beautiful" through the agency of city planning. However, city planning projects, while approached under more scientific auspices, still depend largely on the money of property owners for their execution. Frontage assessments levied on the basis of so-called "benefits" are the primary source of funds for carrying out the work, and as pointed out by C. F. Loweth in this paper on "The Railroad and City Planning," which was published in the *Railway Age* of June 5, such projects may be detrimental rather than advantageous to the railroads so assessed. For example, such plans have not infrequently called for the use of lands adjoining railway rights-of-way for parks or parkways along new boulevards, thereby withdrawing from industrial use areas which might otherwise be developed for purposes to the pecuniary advantage of the railroads, not to mention the assessments made against the roads themselves, from which no returns can be expected.

In many instances these city plans provide for a so-called civic center, one feature of which is commonly a union station which the railroads are expected to create entirely at their own expense, regardless of the fact that existing passenger station facilities may be entirely adequate. But, as if this were not enough, ordinance agreements with cities covering the construction of new passenger stations often provide for the development of auxiliary features at the expense of the railroads which bear little or no relation to the utilization of the station as a transportation facility. For example, the Illinois Central's Chicago terminal ordinance contains provisions for the construction of monumental bridges over its tracks to afford access to park areas now being developed. At

Kansas City the railroads were required to purchase and turn over to the city a large tract of land for use as a park to provide a suitable setting for the union station, while in the negotiations for the new union station in Chicago, express stipulations required the railroads to widen, re-grade and re-pave Canal street for a distance of a mile, the extra width of the street being obtained by dedicating railroad lands to public use.

The railroads are not opposed to city plans in the sense that they signify a conscientious effort to meet the serious problems confronting all cities which arise from rapid growth, street congestion, etc., but they cannot be criticised for defending the interests of their stockholders and patrons against constant demands for expenditures which bear no relation to the primary purpose for which they were organized, namely, to furnish adequate transportation at the lowest possible cost.

New Books

Railroad Construction. Eighth Edition, Nineteenth Thousand. By Walter Loring Webb. 849 pages. 4 in. by 7 in., illustrated. Bound in flexible fabrikoid. Published by John Wiley & Sons, Inc., New York. Price $5.

Since the first edition of this book was published in 1899 railroad construction has been subject to marked changes in methods, in the physical character of the tracks and structures built and as regards the purposes for which it is carried out. Therefore, in keeping abreast of the times in the preparation of succeeding editions the author of any book on railway engineering is confronted with a difficult problem in deciding how revisions shall be handled. It is not surprising, therefore, that some out-of-date material should be permitted to go into the new edition without revision. Thus, reference to pipe culverts is restricted to cast iron and tile, the chapter on grading makes no reference to modern developments in equipment such as the "whirly" and caterpillar shovels. The discussion of ballast fails to mention the present day ballast car.

These details do not detract seriously from the value of the book as an authoritative treatise on the engineering of railroad construction. The chapter on earthwork is particularly complete. Chapters on the mathematics of alinement, switches and crossings, while necessarily less complete than in texts devoted exclusively to those particular subjects, cover the ground well. The preface to this eighth edition calls attention to the fact that the chapters "The Power of the Locomotive" and "Grade" have been largely re-written, these two chapters forming a part of a section of almost 200 pages devoted to economics of railway location, which has long been recognized as one of the strongest features of the book. The last 200 pages are devoted to the usual mathematical tables.

Up-to-Date Air Brake Catechism. By Robert H. Blackall. Revised and re-arranged by F. H. Parke, general engineer, Westinghouse Air Brake Company. Published by The Norman W. Henley Publishing Company, 2 West 45th St., New York. Bound in cloth, 7½ in. by 5 in., 710 pages, illustrated. Price $4.00.

The Air Brake Catechism, by Robert H. Blackall, has for many years been popular with railroad men whose work requires a knowledge of the construction, operation or maintenance of air brakes. This is the thirtieth edition and it has been revised by F. H. Parke of the Westinghouse Air Brake Company, who is a well-known authority on air brakes. Mr. Parke, following the method of question and answer used by Mr. Blackall in his earlier editions, has thoroughly covered the detail construction and operation of the various types of Westinghouse air brakes used not only on railroad cars and locomotives, but on self-propelled rail cars and automotive equipment as well.

The book contains 2,250 questions and answers which cover in detail the ET locomotive brake, the type K quick service freight triple valve, the empty and load freight brake, the old PM high-speed brake, the LN passenger equipment, the present standard PC and UC passenger brake equipments and the various steam and motor-driven air compressors. The book also covers the Westinghouse equipment for electric locomotives, high-speed electric passenger trains, motor trucks, buses and automobiles, and gasoline motor-rail cars. There are also chapters on the standard terminal and compressor tests, hose specifications, train handling and inspection, brake gear diagrams, tables, formulas and other useful information. The operation of all parts of each apparatus is explained in detail and wherever possible a practical way of locating trouble and remedying defects is given.

Books and Articles of Special Interest to Railroaders

(Compiled by Elizabeth Cullen, Reference Librarian, Bureau of Railway Economics, Washington, D. C.)

Books and Pamphlets

Advertising Copy—Principles and Practice, by Lloyd D. Herrold. Chapters 12 to 18 on special types of copy may be helpful. 525 p. Pub. by A. W. Shaw Co., New York and Chicago. $6.00.

Argentine Railway Manual for 1926, by Sir Stephen Killik. 21st annual issue containing brief history of Argentine railways, their present financial condition, lists of officials, headquarters, etc. A large folding map is attached to the back cover. 82 p. Pub. by Effingham Wilson, London, Eng. 2 shillings sixpence.

The Dreadful Decade, by Don C. Seitz. Various events, including railroad, in the decade 1869-1879 between the reconstruction period and resumption of specie payments. 312 p. Pub. by Bobbs-Merrill, Indianapolis, Indiana. $3.50.

Factors Affecting Prices—A Selected Bibliography, Including Some References on the Theory and Practice of Price Analysis, compiled by Louise O. Bercaw. Agricultural Economics Bibliography No. 14. Includes sections on market structure, business cycles, and statistical method. 40 p. Issued by Library, U. S. Bureau of Agricultural Economics, Washington, D. C. *Apply.*

Periodical Articles

Archives Coming to Occupy Prominent Position in Modern Business. Description of the filing of "inactive" records of the Guaranty Trust Co., importance of old records to business concerns, destruction of obsolete records, etc. Guaranty News, May, 1926, p. 7-9.

Autogenously and Electrically Welded Boilers and Containers, by E. Hohn. Results of an investigation of the strength and tenacity of parts welded together, financed largely by Swiss Union of Steam Boiler Users. Locomotive boilers, p. 608-609. Mechanical Engineering, June, 1926, p. 603-609.

Fuel Oil for Railways, by J. C. Martin. "This paper . . . will point out the reasons that economically warrant the continuance of its use on railways . . ." Supplement to June, 1926, Mechanical Engineering, p. 671-672.

Les Grandes Compagnies de Chemins de Fer en 1925, by Georges de Nouvion. Financial and operating results on the large French railway systems. Journal des économistes, May, 1926, p. 217-255.

Through the Deserts and Jungles of Africa by Motor, by Georges-Marie Haardt. A railroad survey that was also intended to demonstrate the possibilities of "roadless traction" in undeveloped regions, and which finally took along scientists, aviation experts, and others not contemplated in the original plans. Maps and illustrations. National Geographic Magazine, June, 1926, p. 650-720.

Transportation of Milk and Milk Products, by Russell Smith. Modern methods described. Creamery and Milk Plant Monthly, June, 1926, p. 44-48.

Letters to the Editor

College Man Question Faced Frankly

CLEVELAND, Ohio.

TO THE EDITOR:

I do not feel that I can afford to let pass an opportunity to comment on the letter published in the March 27 issue of the *Railway Age* on the subject of the college man in railroad work. Apparently the writer of that letter has had a rather unfortunate experience in his railroad career and I am wondering whether or not a constructive analysis of what he seems to feel is his failure to make progress would not bring out the fact that possibly he was somewhat at fault himself rather than the railroad he worked for. I feel that I can discuss this subject in an understanding and possibly a sympathetic manner because of the fact that I am one of those who entered railroad service after leaving college and served in various capacities in the mechanical department for a period of over ten years.

Apparently one of the real problems to be solved in this question of improving the relations of the college man and the railroads is to make it possible for the technically educated young man who would enter railroad service to know before he starts in just what a railroad is, how it is run and what the demands of the service really are.

I believe that a graduate from an engineering school who anticipates a railroad career should carefully consider two questions which are applicable to engineering work in any field, namely: Do I want to use my engineering education as a basis for a purely engineering career, or do I want to use it, together with a supplementary business education, as a means of eventually reaching an executive position?

To my mind the man who would follow the first course and who is interested in engineering work for the work itself is sure to suffer somewhat of a disappointment in railroad service. The experience of T. U. C. K. in the engineering department seems to indicate that he is that type of an engineer—one who is primarily interested in new design and construction. Unfortunately, relatively little of the work performed by the average railroad engineering office is of a nature that will keep such a man continuously occupied with new and interesting problems. On the other hand, if the college man entering railroad service is the type who wishes to use his engineering education as a means of possibly reaching an executive position either in or above the engineering department, then there is one thing that cannot be overlooked—that an engineer as such, is an engineer only up to a certain point, beyond which he gradually becomes more of a business man and less of an engineer. If, up to that point he has failed to educate himself in the principles of business, the chances for becoming an executive are not great. The railroad executive whose duties may demand an engineering knowledge are such that a relatively small portion of the things which he must know involve a detailed knowledge of engineering principles as compared with the principles of business administration.

The engineering department of a railroad is merely an accessory to an immense business organization, which like any other business, is operated to make money. Unfortunately, the mechanical and the civil engineering departments are on that side of the fence where they are in position only to spend money and save money and as a consequence the labors of the members of such departments are often looked upon as "non-productive." If any college man intends to enter railroad service and be satisfied with what he can learn in any one office or department it seems to me that he will make no greater progress on the railroad than if he pursued the same tactics in an industrial organization. Regardless of what may be your field of endeavor, the big thing is to know enough about the job ahead of you to be able to step into it when the opportunity offers. As has been pointed out many times the real value of a college education, aside from its associations, is that it trains a man to know where to look for that information which he may need. Why should any college man consider that there is no opportunity to learn on a railroad simply because he feels that he has exhausted the possibilities of his own department?

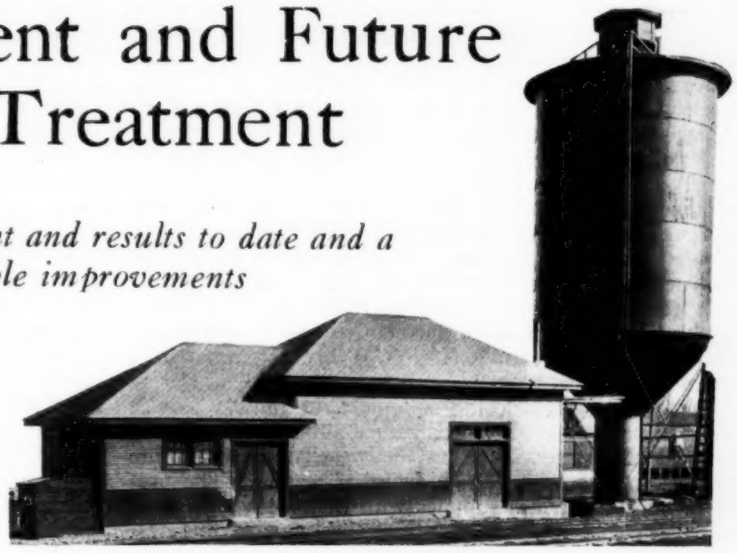
Unfortunately, a railroad, like some industries, cannot be run on paper. Operations may be carefully planned beforehand but conditions over which no one has any control may make it necessary to alter these plans at the last moment. Therefore any college man in railroad service who fails to get as much as possible of the practical side of railroading seems to me to be doomed to make little progress in the railroad game. Any man who has spent four years in college learning how to find out things certainly should not be at a loss for ways and means to get all he wants on a railroad.

T. U. C. K. pointed out the discouraging effect of individuals who have been in the service of the railroad for several years but who have never advanced in the scale of responsibility. I can call to mind many individuals of such a type and in most cases the reason why they are where they are is simply because they have been satisfied to deal only with such problems as came to them, and who, in many cases, were not willing to accept the kind of a responsibility which railroad service imposes when it came their way. Individuals of this type can just as readily be found in an industrial organization as in railroad service and in 99 cases out of 100 the reason for their predicament is identically the same. On the other hand I just want to cite one example of a man whom I worked with, who, at the time I entered railroad service was a gang-foreman in a locomotive shop. He was one of that great majority of railroad men who have never had a college education but who had the desire to get there just the same. Through home study, at the sacrifice of many hours of pleasure, he acquired a knowledge of mechanical engineering and today this same man is superintendent of one of the largest locomotive shops in the east at a salary which any college man would hardly consider as not being worth his while even after ten years out of college. If a man of this type with no educational advantages and, as I happen to know in this case, with none of the proverbial "pull" can attain such a position, it does not seem to me that a college man, if he has the same desire to get there, should fail in his efforts.

Most of us, regardless of what field we are working in, are working for two things—the satisfaction of having performed some worth-while service as we look back on a job that is done and, second, enough remuneration to feel that it has been personally worth while to have performed that service. I do not believe that to confer a distinctive title upon a college man in railroad service would better his situation materially. I cannot help but recall a remark which was made by one of my superior officers some time ago in connection with titles when he said that they were "created with the flourish of a pen and wiped out with a bad breakfast." Some of the real jobs on any railroad are those which carry unimposing titles and, on the other hand, some jobs with magnificent titles leave much to be desired on pay-day. W. C. HOWARD.

The Past, Present and Future of Water Treatment

A review of the development and results to date and a forecast of probable improvements



THE treatment of railroad water supplies formed the subject for consideration by one of the sessions of the annual convention of the American Water Works Association at Buffalo, N. Y., on June 9. Under the auspices of the Committee on Boiler Feed Water Studies, three papers were presented on phases of this subject by S. C. Johnson, chief chemist, water supply department, Chesapeake & Ohio; R. E. Coughlan, supervisor of water supply, Chicago & North Western; and C. R. Knowles, superintendent of water service, Illinois Central System.

These papers are abstracted below:

A Review of the Developments to Date

By S. C. Johnson

Chief Chemist, Water Supply Department, Chesapeake & Ohio

The quality of the water supply is closely associated with the operating efficiency of a railroad and its result has a marked influence on the locomotive maintenance expense. Of the 350 billion gallons of water now being used annually for steam purposes on American railroads, it is estimated that 50 billion, or about 15 per cent, is receiving treatment in some form. At a general average cost of 4 cents per 1,000 gal. for treatment, the yearly operation expense is in the neighborhood of $2,000,000. There are approximately 1,200 water stations, out of a total of 16,000, where chemicals are added and the total investment in softening plants, including the inexpensive as well as the elaborate types, is at least $10,000,000. It is estimated that these plants are removing 100,000,000 lb. of scale-forming solids annually, which, if allowed to enter the locomotive boilers, would involve an additional expense in locomotive operation and maintenance of approximately $13,000,000.

The properties in water which cause trouble in stationary power plants are of similar concern in locomotive practice, although the refinements are not, as yet, applicable. The chief concern seems to be the non-carbonate scale which causes damage by forming a hard cement-like coating on the heating surfaces with consequent deterioration of the material and loss of fuel. The carbonates of calcium and magnesium are troublesome when present in large quantity, due either to increasing the bulk of the scale or precipitate. Waters are occasionally encountered which initiate pitting and corrosion troubles if not corrected. In some parts of the country, particularly that section commonly known as the alkali plains, it is necessary to use waters high in alkali salts, principally sodium sulphate, which not only aggravates the foaming tendency of the waters, but also contributes to an electrolytic condition which accentuates pitting and corrosion unless counteracted. It is possible that silicious matter has entered into the scale problems in some quarters but the complaints from this possibility have been of minor importance and it is only within a recent period that serious consideration has been given to the elimination of mud and suspended matter.

Early Development Most Rapid in Middle West

The development of water treatment on American railroads has received its greatest attention on middle western systems where the objectionable quality of the natural waters was such that some form of treatment early became an operating necessity. Efforts toward correction were confined at first to treatment, with so-called boiler compounds or metal treatments with secret formulae.

The next development in counteracting the harmful impurities was in the application of soda ash, both direct in the boiler or at wayside tanks. The scale reduction properties of this material are well known and this appears to be the least expensive systematic treatment from a first-cost standpoint. However, the precipitate formed by this reaction is so finely divided that the sludge in the boilers, together with the increase in alkali salt concentration, causes serious foaming conditions and the system has been found objectionable unless followed up with careful supervision to insure the boilers being blown down sufficiently to maintain the concentration within workable limits.

The systematic treatment with soda ash at Wayside tanks appears first to have been developed on the Chicago, Burlington & Quincy and later extended to the Wabash,

the Frisco, and the Alton, while several other roads are using it to some extent. The method consists in treating all waters, where necessary, to insure an excess of about two grains per gallon of sodium carbonate. A frequent check is made of samples from locomotive boilers and an effort is made to maintain approximately 15 per cent of the total dissolved solids as sodium carbonate. This internal inspection is also necessary to insure sufficiently frequent blowing to keep the total dissolved solids below 125 grains per gallon in order to prevent foaming delays. Where sufficient supervision is provided to insure the carrying out of the predetermined practice, results have been secured. However, the necessity for the careful check and follow-up of the locomotive operation presents such difficulties that the extension of this system has been somewhat limited.

Experiments with zeolite softening for railway service have not been altogether satisfactory although tests being made at the present time on the western coast indicate possible success with certain types of waters. The preponderance of surface supplies with their occasional high content of suspended matter, limit the scope of this system as well as the dissolved solids quality, unless prefiltration is provided, with additional expense for installation and maintenance.

Methods

The better established method of railway water softening consists of the addition of lime and soda ash to the water in predetermined amounts at wayside settling tanks. Its object is not only to soften the water but also to remove the precipitated sludge with mud or suspended matter, so as to deliver the waters to the boilers not only soft but clean.

The lime and soda process of treatment in railway service has developed from the simple intermittent system which consisted merely of two or more tanks which were filled, treated and used alternately, through the intricate proportioning devices with continuous automatic proportioning, back to the more simple continuous systems.

The chief essentials are proper chemical proportioning and sufficient mixing and reaction time followed by sedimentation and clarification before delivery of water for use.

Many intermittent systems are still in use and the capacity of treating tanks varies from 10,000 gal. to 500,000 gal., but the governing principle is the same and similar satisfactory results can be secured. The usual means of agitation is by compressed air.

Plants of the continuous type consist of large tanks, usually of steel, with inside tubes of sufficient size to retain the water during the mixing and reaction period of from 30 to 45 min. The water and chemicals are mixed in these tubes in continuous proportion, flowing from the mixing tube to the bottom of the sedimentation tank from which they rise to a predetermined point before the clear water is drawn off for service. The specific gravity of the precipitated sludge is sufficiently greater than water to permit clarification in five hours if the vertical velocity of the settling water does not exceed eight feet per hour, provided, of course, that the proper amounts of chemicals have been added to insure complete reaction and unbalanced equilibrium is avoided. If clarification troubles are experienced, filters are sometimes provided. Some experimenting is again being done with the elimination of the downtake tube, merely running the chemicals and water together without special mixing or agitation at the bottom of the sedimentation tank, although experience with this system some years ago was not entirely satisfactory.

In any system of water softening for railroads, the largest single factor in securing satisfactory results lies in competent and interested supervision. The chemical quality of the raw and softened water should not only be checked at frequent intervals but inspection should also be made of the mechanical facilities to insure dependable and uninterrupted service. On railroads where treatment is practiced to any appreciable extent, systematic methods are therefore necessary to permit the plants to be operated with a minimum force.

Savings Resulting From Water Treatment

The savings possible through improvement in the quality of railroad water supplies are necessarily dependent upon local conditions. In 1914, the American Railway Engineering Association presented figures to show that the cost of each pound of incrusting matter permitted to enter the locomotive boiler, in such condition that it would deposit as scale on the tubes and sheets, was seven cents, considering only the effect on fuel consumption, boiler and roundhouse repairs and engine time. This figure, transposed to present day prices, is 13 cents. Study by a special committee of the American Railway Engineering Association for the past five years indicates that this figure is conservative. There is no question but that, with proper treatment of the water, scale and pitting conditions, with their incident boiler maintenance expense, can be largely eliminated and that the fuel consumption in clean and dry boilers is much less than with leaky or badly scaled power. In addition, the large intangible benefits, such as the elimination of engine failures on the road and the reduction in delays to traffic and train movements, usually far outweigh the tangible savings in fuel consumption and boiler repairs. However, each individual case is a problem in itself and requires special study in order to obtain the best results.

On the Chesapeake & Ohio water softening plants were in service at 30 of the 207 water stations during 1925. Of these plants, 23 were of the continuous type, 2 intermittent and 5 of the simple soda ash system. Of the 6,135,922,000 gal. of water used for steam purposes, 2,496,038,000 gal., or 40.7 per cent, was treated and a total of 2,672,080 lb. of injurious scaling and corrosive matter removed before the water was delivered for steam boiler use. The total cost for chemical treatment, including operation, maintenance, interest and depreciation, was $103,715 or an average of 4.5 cents per 1,000 gal., while the cost for chemicals alone only averaged 1.98 cents. The estimated net saving for the year by reason of this treatment amounted to $243,675 which represents 67.2 per cent on the $356,323 invested in water treating facilities. This estimated saving averages only $480 per locomotive using the treated water which is a conservative rating.

The wide range of the problem of water treatment, including the design and installation of plants, as well as the individual studies of the water quality and the check of the actual treatment and its effect upon transportation and train movement, warrants the special study which is being given to it on many roads. In the handling of this problem over the wide range of territory involved on even the smaller railway systems, it is necessary to have the closest co-operation between the chemical supervision and the men actually operating and maintaining the plants, as well as the interest and assistance of the motive power and transportation departments, to secure the best, or even passable results. The best mechanical facilities will function only in a perfunctory manner or fail entirely if not followed up by a careful check system, and it has been found that an organization with a definitely fixed responsibility is the first essential to successful results from a railway water treatment.

A Statement of the Problems Now Confronting the Water Service Engineer

By R. E. Coughlan
Supervisor of Water Supply, Chicago & North Western

On the Chicago & North Western practically all of the water supplied to boilers, except that obtained from lakes and rivers in northern Wisconsin and northern Michigan, requires treatment. Partial treatment and internal treatment have been used for many years. The extensive water treatment program of this railway was started in 1903 when 16 lime and soda ash treating plants were built in Iowa, where the water is hard, due to the large quantity of sulphates of magnesia and lime contained in solution. These were the pioneer water softening plants in that section of the country and have been added to from time to time, until at present 47 lime and soda ash water softeners are in operation and 10 more are under construction. These are supplemented by partial treatment and internal treatment where local conditions warrant. The intermittent type of softeners was the first installed. In 1922, the first continuous type softener was installed. Where internal treatment is used, this treatment is controlled by means of chemical tests made on samples of water taken from the boilers at each terminal. Simple feeding devices regulate the amount of treatment.

The boiler failure report of the C. & N. W. for 1910 shows 2,132 failures, chargeable to water conditions. The same report for 1925 shows 37 failures. The monthly boiler failure report for February, 1910, shows as follows:

Boiler Failure Report for Month of February, 1910

Cause of Failure	
Leading Flues	319
Leaking Fireboxes	22
Leaking Arch Tubes	0
Flues Burst	3
Arch Tubes Burst	30
Foaming	17
Total	391

The same report for February, 1926, shows as follows:

Boiler Failure Report for Month of February, 1926

Cause of Failure	
Leaking Flues	0
Leaking Fireboxes	0
Leaking Arch Tubes	0
Flues Burst	0
Arch Tubes Burst	0
Foaming	0
Total	0

Water treatment is one of the essential factors which make it possible to obtain the longer daily mileage which most railroads are now receiving from locomotives in passenger service. A few years ago, it was the practice to change locomotives about every 100 to 150 miles. Now many railroads that are equipped with water softening plants use one locomotive for continuous runs of much longer mileage. The C. & N. W. now operates locomotives in passenger service from Clinton, Iowa, to Omaha, Neb., a distance of 350 miles, which make a round trip of 700 miles each day. Another western railroad operates locomotives in passenger service 600 miles without change, while still another has completed test runs of over 1,700 miles, one locomotive pulling the train the entire distance.

Progress in Reduction of Corrosion and Pitting

With the problem of incrustation of boilers practically under control, more attention is now being given to the pitting of flues and the corrosion of boiler sheets. Many theories as to the cause of this trouble have confused the issue. Many committees have held symposiums on the subject. The railroad water service engineers have not been idle, although their work has been somewhat hampered due to incomplete records and the increasing evaporating power of boilers. When it was found that removing the scale did not prevent corrosion, further studies have been made along three special lines, namely: (1) Use of feed water heaters to eliminate oxygen; (2) counter-electrical potential devices, and (3) excess treatment.

The first two of these methods are still in the experimental stage, each method having its respective merits and adherents. The excess treatment method has shown great possibilities where it is practicable to apply it in railroad service. This method, proven in the laboratory, consists in the addition of an excess of caustic soda, caustic lime or sodium carbonate over that required to combine with the scale-forming salts. The success of this treatment depends upon uniformity of treatment over an entire locomotive district to prevent foaming. Where it is possible to secure this uniformity, high concentrations of alkaline salts are carried in the boilers with practically no foam trouble.

The C. & N. W. has a locomotive district where 50 per cent of the natural water contains over 50 grains per gallon of sodium carbonate. By treatment of the remaining water to a similar composition, a concentration of over 8 per cent normal alkalinity is carried without trouble. Pitting and corrosion on this district are unknown and needless to say the boilers are clean. Additional lime and soda ash softeners are being installed on other locomotive districts as rapidly as funds become available, so that in a short time this method of treatment will be in general use.

One of the railroads having 71 lime and soda ash softeners in operation is treating the water to less than one grain per gallon hardness, leaving in the water an excess of lime and soda ash for the purpose of eliminating pitted flues. This program was started early in 1922 and very gratifying results have been obtained. The boilers carry a very high percentage of alkaline concentration with very little trouble.

The quality of the material used in boiler construction has also been thoroughly investigated. At the present time, most of the railroads have standard specifications for boiler steel. These specifications are strictly adhered to in order to avoid the use of non-homogeneous steel which may set up electrolytic reaction, leading to corrosion. Protective coatings of lead or similar material have also been used with varying degrees of success.

Progress Through Co-operation

While the entire principles of water softening and the control of corrosion may be explained theoretically in very simple terms, practicable applications are sometimes very difficult. Experimenting with the boiler of a locomotive in operation is entirely different from research work conducted in a laboratory. Foam trouble and priming cannot be tolerated. The water service engineer must be sure of the results. The movement of trains safely is the first consideration. Progress can only be attained with the co-operation of all departments.

A Forecast of the Probable Future Development of Railway Water Treatment

By C. R. Knowles
Superintendent Water Service, Illinois Central System

The railroads have passed through the period of pioneer development in the treatment of locomotive water supplies and are now approaching an era of refinement that will undoubtedly lead to still greater development. The foundation of water softening and treating practice has been laid and it is unlikely that there will be any radical departure from these principles. At the same time it is becoming more and more apparent that refinement must take place in many of the present methods of treatment and that careful consideration should be given to the possibilities of new methods.

As far as the railroads are concerned, water treatment has not only been an economic necessity but in many cases it has been an actual operating necessity. As train loads became heavier and boiler pressures and ratings were increased the treatment of many of the worst waters became imperative. The available information regarding methods of treatment was limited, and many of those who first undertook to treat the water were confronted with the problem for the first time and were probably in the same state of mind as the first man who started out to soften water more than eighty years ago, the idea in the beginning being simply to get the water in a tank, add the necessary chemicals and let it settle. Certain refinements were developed through experience as time went on and it may be expected that the art will continue to develop by the same process.

It was quite natural that the worst waters should receive attention first for while the less troublesome waters of comparatively low scaling content were costly from the standpoint of fuel economy and boiler maintenance, they did not interfere seriously with train operation. As treatment has been extended to include practically all of these very bad waters, the water that was considered fair a few years ago has become the bad water of today.

The value of water treatment has become so well established through records of savings in boiler repairs, fuel economies and the reduction of engine failures that it is becoming apparent that treatment must be extended to include these waters of so-called fair quality. The cost of providing adequate motive power for the movement of trains is constantly increasing, and with investments of from $60,000 to $70,000 each for locomotives, poor water conditions can no longer be tolerated.

Longer engine runs are another factor in locomotive operation that is making better water conditions necessary. The Northern Pacific recently made a record-breaking continuous freight run in which a Mikado type coal-burning locomotive pulled a train from Seattle, Wash., to St. Paul, Minn., without being uncoupled from the train and without receiving any terminal attention en route. The distance of 1,898 miles over three mountain ranges with maximum grades of 2.2 per cent was covered in 109½ hours total time. The Great Northern ran an engine with a fast mail train from Seattle to St. Paul and return, a total distance of 3,462 miles, a short time ago, while the Burlington handled a train of 90 cars loaded with 6,450 tons of coal from West Frankfort to Chicago, a distance of 413 miles with one mountain type locomotive. The Southern Pacific is running passenger trains regularly between El Paso and Houston, Texas, a distance of 832 miles, without changing engines. While many of these long runs are test runs today, they will be a regular thing in the near future.

All of these developments in locomotive operation call for water supplies of the highest quality, and it is evident that the railroads are going to demand much more of the water service engineer in the future than they have in the past. Some of the improvements in the quality of water will no doubt be accomplished through the development of new and better supplies, but in the great majority of cases it will mean the improvement of existing facilities by establishing additional treating plants, etc.

The Removal of Suspended Matter

One of the problems that will undoubtedly receive more attention in the future than it has in the past is the removal of mud or other suspended matter from railroad water supplies. While mud removal has not been altogether neglected, it has hardly received the attention it deserves, to say the least. This apparent neglect is not due entirely to failure to appreciate the importance of removing suspended matter, but rather to the fact that through necessity efforts were concentrated on improving waters high in dissolved solids, and in some instances to lack of sufficient finances to provide the required facilities.

The rivers of the middle west carry an average of from one to one and one-half pounds of suspended matter per thousand gallons of water throughout the year with a maximum of five or six pounds during the freshet seasons, while the southern and some of the western streams carry still more. The objection to the presence of mud or other suspended matter in boiler waters is not altogether due to the necessity for frequent washing of boilers to prevent foaming and possible mud burning of sheets due to the use of turbid water, but also to the fact that the mud is deposited on the tubes and sheets and in the presence of dissolved solids helps to form scale.

Mud removal installations consist largely of sedimentation basins alone. They are fairly effective where the mud is heavy and settles rapidly but the most satisfactory results can be secured by coagulation and sedimentation, followed by filtration. Most turbid waters carry considerable amounts of scale-forming solids in addition to the suspended matter and as softening the water as well as removing the mud add little to the cost, the development along this line will probably include complete softening equipment for the removal of matter in solution as well as in suspension.

Filters

Another possible future development of water treatment is the more extensive use of filters. A large majority of the railway water treating plants depend entirely upon sedimentation to produce a clear treated water, although the limitation of sedimentation alone in clarifying the water is recognized in the entensive use of iron and alum in various forms as an aid to the precipitation of the sludge.

It is a commonly accepted fact that the temporary hardness remaining in water after being softened with lime and soda ash is materially lowered by filtration through sand. Where filters are used in conjunction with lime and soda ash softeners no other coagulant is required, as a general rule. The amount of suspended solids that may

be removed by filtration, even after treatment and sedimentation, is of appreciable value, not only in reducing the hardness and preventing after precipitation in distribution systems, but also in reducing the losses in fuel and water through less frequent blowdowns of boilers. Filtration may well be compared to a continuous blowdown in its effect, as the suspended matter that would otherwise remain in the water after ordinary treatment is being removed constantly as the water is passing through the filter. The additional cost of filters has been fully justified by the roads that are using them and their universal adoption as an adjunct to water softening will undoubtedly follow as their value becomes better recognized.

Treating Tanks

Improvements in the design of water treating plants will no doubt include a more efficient type of treating tank, particularly in regard to sludge removal. Many different designs have been followed in the construction of reaction and sedimentation tanks, the most widely used being the common flat bottom tank, either of the standpipe type with the bottom at the ground level, or erected on an elevated tower. In this type of tank, as commonly used, the sludge is deposited over the entire bottom of the tank, its removal necessitating the construction of an expensive sludge-collecting system, which at its best leaves much to be desired. This sludge removal system usually consists of an arrangement of pipes with openings placed at uniform intervals over the bottom of the tank. In the larger tanks they are so arranged that they may be operated in sections with from two to four sludge valves for each tank. Another type is so arranged that the collecting pipes may be rotated over the bottom of the tank. None of these systems is entirely satisfactory for they do not completely remove the sludge and they are extremely wasteful of water, as the sludge nearest the outlet is the first to be picked up and two-thirds of the openings are usually discharging clear water before the sludge at the outer edge of the tank is disturbed.

One of the principal developments in the design of treating tanks is the conical bottom tank with a large riser pipe. The angle or slope of the cone is 45 deg., and the drum or riser pipe is from 4 to 6 ft. in diameter and serves as a sludge-collecting chamber. The sludge falls to the bottom and is collected in the mud drum as it forms, where it is easily and completely removed through a single opening and with a minimum waste of water. Actual tests to determine the amount of water used in removing sludge show that the flat bottom tank requires from five to ten times more water in sludging than a conical bottom tank of proper design.

The remarkable efficiency of the conical bottom tank in sludge removal and economy in the use of wash water are factors that will result in its more extensive use for water treatment. Experiments are also being conducted with continuous sludge removal systems and tanks of other designs, and it is evident that the development of water softening will include tanks of more efficient design.

Zeolite Softeners

Zeolite water softeners are receiving considerable attention as a possible method of treating water for locomotives. One installation on a western road is being watched with much interest and the results obtained will undoubtedly be a factor in determining their use by other roads, as well as extending their use on the road in question.

The chief concern regarding the use of zeolite is on account of the possibility of increased foaming due to the conversion of the various elements in the untreated water to sodium compounds in the treated water which is characteristic of zeolite treatment. It is claimed that the foaming may be minimized with the exclusive use of zeolite treated water, which is practically free from suspended matter. This is not always possible on a railroad unless entire engine districts are equipped with zeolite treatment. Another factor which has reacted against their use for railroad supplies is the fact that with certain waters pre-treatment is necessary. For example, if the water contains an appreciable quality of iron it must be pre-treated before passing through the zeolite softener, or if the water is turbid it must be filtered before it can be handled successfully. With the lime and soda ash plant no pre-filtration is required, as sand filtration after reaction and sedimentation is provided in all modern equipment.

A possible solution of the problem is a combination lime-soda-zeolite plant with pre-treatment by lime and soda ash for the removal of the bicarbonate of lime and magnesia, iron and free carbon dioxide, the neutralization of sulphates and the reduction of organic matter, silica and alumina, followed by the zeolite treatment to produce a water of zero hardness with a minimum of suspended matter. If this type of plant can be developed successfully and economically it is not at all unlikely that zeolite treatment will be further extended in the treatment of locomotive supplies.

Internal Treatment

Internal treatment of boiler waters involves the introduction of chemicals and other substances into storage tanks, the tenders of locomotives or direct into the boiler. This method of treatment as applied direct to boilers is the oldest form of treatment known, probably being as old as boilers themselves. It has been improved upon from the old hit-and-miss form of treatment until it has become a generally accepted process. Reputable manufacturers offer forms of treatment that are based upon chemical examination of the water and that are producing good results. The combination of chemicals used in this form of treatment is generally referred to as boiler compound. The future development of this form of treatment will be the elimination of the quack cure-all compounds and more uniform methods of feeding the chemicals to the water, probably through a more extensive use of compound feeders.

General

Stationary power plants are adapted to the use of many devices for the purification of boiler feed waters that cannot be used on locomotives on account of the limited space available. Therefore, it is impossible to make any prediction as to the probable future use of de-areators, deconcentrators, etc., on locomotives, although their development for this purpose is not beyond the realm of possibility. In fact many of the feed-water heaters used on locomotives embody the feature of oxygen removal in addition to heating the feed water. Some authorities claim great benefits from this feature in preventing corrosion, and it is possible that as more locomotives are equipped with the open type of feed water heater they will become an important factor in improving the quality of the feed water. The claim is also made that thermic syphons and plates as installed in locomotive boilers tend to improve feed water conditions, particularly as regards corrosion, through increased circulation of the water in the boiler.

It is impossible to make any prediction as to the possible future development in the use of the less common reagents in water softening, such as the barium salts, for example. As with many other reagents, treatment with barium is not yet commercially practicable as a rule al-

though barium salts may ultimately be manufactured at a cost that will result in their more general use. However the principal developments, in the near future at any rate, will be based upon the lime soda ash treatment.

There is ample room for future development in railway water treatment; at the same time there are certain limitations that must be considered. Water softening and treatment for steam making must of necessity be kept within the bounds of the more simple reaction and commercial reagents.

Bureau of Safety Reports on a Transverse Fissure

A PASSENGER train on the Wabash was derailed near Tolano, Ill., on July 29, 1925, resulting in the death of one passenger and the injury of five passengers and four employees. This derailment was caused by a transverse fissure in the head of a 90-lb. rail, the initial point of rupture being 20 ft. 6 in., from its receiving end. The leaving end of the rail was broken into six short fragments, in some of which incipient transverse fissures were found. The rail was rolled by the Illinois Steel Company in February, 1916, and laid in track two months later.

James E. Howard, engineer-physicist of the Bureau of Safety of the Interstate Commerce Commission, made an investigation into the reason for the failure of this rail, from a report on which the following is abstracted:

The initial point of rupture was 20 ft. 6 in. from its receiving end. The leaving end of the rail was broken into six short fragments, in some of which incipient transverse fissures were displayed.

Interest attaches to conditions which prevail at the nuclei of transverse fissures, whether or not there is continuity of the metal at such places antecedent to the inception of the fissures. Shattered zones are encountered in the central core of the head; groups of cracks where no foreign inclusions of any kind are found. They represent cooling effects, where the rails in cooling from the finishing temperatures of the rail mill acquire internal strains, culminating in some cases in small irregularly oriented fissures. Cooling strains, in a measure, are relieved when cracks ensue.

Absolute proof is wanting in many cases whether a minute shrinkage crack was at the nucleus of a fissure, whether internal strains on the verge of rupture existed at that place, or whether the inception of the transverse fissure was due solely to the internal strains set up by the wheel pressures. Transverse fissures located entirely outside the limits of shattered zones presumptively owe their inception to wheel pressures alone. Interesting questions abound descriptive of the phases of rupture as well as those explanatory of the cause of transverse fissures.

The opinion prevails, among those who are not prepared to place full responsibility for the formation of transverse fissures to service strains and stresses received in the track, that some antecedent state exists which creates a nucleus, all admitting that the extension or enlargement of the transverse fissures are due to track strains and to those strains only.

The nucleus of a transverse fissure, representing its point of inception, displays an area of one per cent or less of the sectional area of the head. The explanation offered is not an encouraging one, which places responsibility for the occurrence of a transverse fissure upon a pre-existing crack in the head of the rail not exceeding one one-hundredth of its area, taking into consideration also that the pre-existing crack occupies a position not among the fibers which are most remote from the neutral axis of the rail. The first stage of enlargement of such a pre-existing crack would obviously demand a force nearly identical in magnitude to one necessary to start a crack in an intact rail. This argument does not give much encouragement to the elimination of transverse fissures, which have their origins as shrinkage cracks, nor does it remove the responsibility far from the influence of the wheel pressures taken alone.

Omission of the consideration of the effects of the intense impinging pressures between the tread of the wheel and the head of the rail has been quite general. This feature, which constitutes the real crux of the rail problem, has been practically ignored; a better understanding of the case will be reached when it is taken into account. Weights and shapes of rails are changed and specifications revised without touching upon this vital element.

When wheel loads are mentioned those of the equipment as well as those of the motive power are included. Due to the greater number of repetitions of wheel loads of the equipment, their influence appears to exceed the lesser number but heavier loads of the motive power. This result is entirely consistent with carefully conducted laboratory tests on repeated stresses.

In retrospect, no remedy has been found for the prevention of transverse fissures attaching to current grades of steel and present practice in wheel loads. Nor has it been possible to predict when transverse fissures would display themselves with respect to longevity of the rails in service. It is well established that hard steels develop transverse fissures without distortion of shape under wheel loads and with slight loss of metal by abrasion; also that all weights of rails display this type of rupture. Furthermore, it has been shown that the display of transverse fissures predominates on heavy-traffic tracks in comparison with rails carrying the same engines but with light-weight equipment of return-train movements, and that low rails of curves display more fissures than high rails. Efforts to detect the presence of incipient transverse fissures in rails in the track have been unsuccessful.

The present situation is disquieting, with inability to prevent their recurrence, and without knowledge of their existence in the track until some untoward circumstance reveals their presence. They constitute an ever-present menace to life and property, demanding more than passive endurance. The most definite statement permissible is that by the process of elimination the responsibility for the display of transverse fissures attaches to high wheel loads, which merely reiterates statements which have made from time to time since this insidious type of fracture was first brought to general notice.

It is the opportunity and the duty of the users of rails to look diligently into the cause of the formation of this type of fracture. They have the necessary material at hand with full knowledge of its behavior. The results of efforts which have come to notice have contributed toward the elimination of probable causes. Positive data should now be looked for.

Freight Car Loading

WASHINGTON, D. C.

REVENUE freight car loading in the week ended May 29 exceeded the million mark by a still wider margin and the total—1,081,164, is the largest ever reached in any one week at this season of the year. It was an increase of 168,077 as compared with the corresponding week of last year and an increase of 260,613 as compared with 1924. Corresponding figures for the last two years were exceeded in all districts and in all classes of commodities. The largest increase was in miscellaneous freight, loadings being 73,048 cars more than last year and 116,644 more than in 1924. The summary, as compiled by the Car Service Division of the American Railway Association, follows:

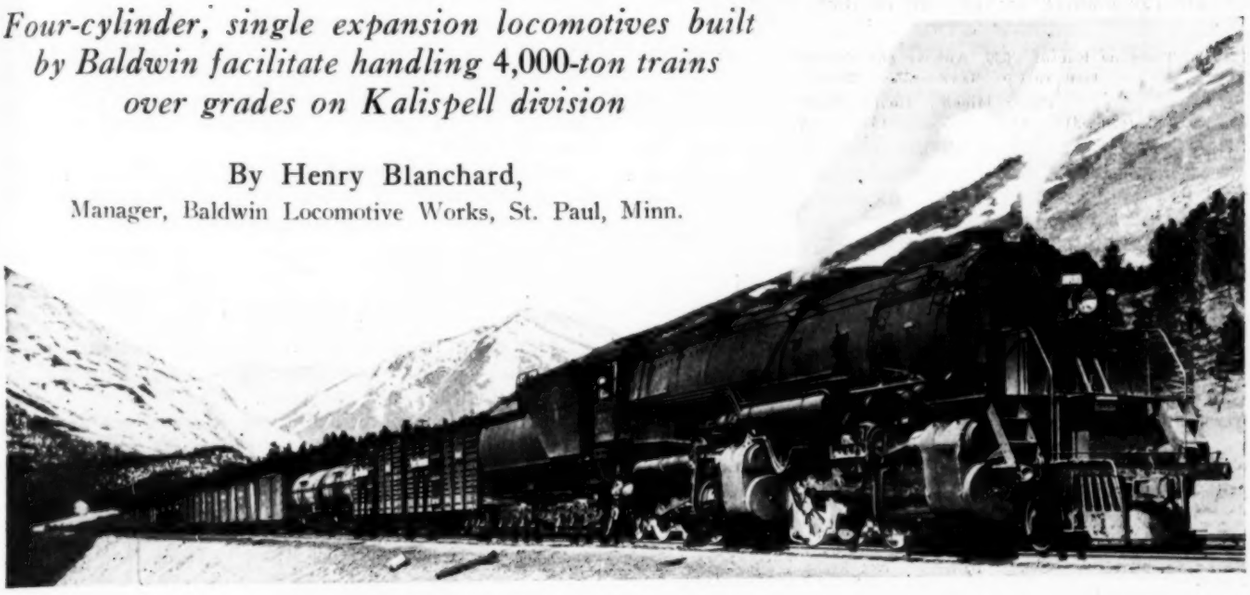
REVENUE FREIGHT CAR LOADING—WEEK ENDING SATURDAY, MAY 29, 1926

Districts	1926	1925	1924
Eastern	262,276	210,596	186,275
Allegheny	218,912	184,206	164,636
Pocahontas	57,816	49,723	37,472
Southern	154,428	139,724	123,417
Northwestern	165,894	140,964	131,980
Central Western	144,572	122,007	123,632
Southwestern	77,266	65,867	53,139
Total Western districts	387,732	328,838	308,751
Total all roads	1,081,164	913,087	820,551
Commodities:			
Grain and grain products	44,216	36,815	36,214
Live stock	28,643	24,897	27,482
Coal	177,600	149,604	120,210
Coke	11,790	9,184	8,176
Forest products	79,157	70,785	67,701
Ore	66,715	59,690	56,335
Mdse. L.C.L.	266,966	229,083	215,000
Miscellaneous	406,077	333,029	289,433
May 29	1,081,164	913,087	820,551
May 22	1,039,385	987,306	918,224
May 15	1,030,162	985,879	913,201
May 8	996,527	983,034	908,203
May 1	995,641	984,073	913,550
Cumulative total, 22 weeks	20,924,314	20,362,618	19,559,970

Service of Simple Mallets*

Four-cylinder, single expansion locomotives built by Baldwin facilitate handling 4,000-ton trains over grades on Kalispell division

By Henry Blanchard,
Manager, Baldwin Locomotive Works, St. Paul, Minn.



Great Northern Simple Mallet Hauling 100-Car Train Over the Rockies

THE first sub-division of the Kalispell division of the Great Northern extending from Cut Bank, Mont., westward to Whitefish, Mont., a distance of 126.95 miles, includes the crossing of the continental divide in the Rocky mountains, which is accomplished at the low elevation of 5,213 ft. above sea level.

The maximum or helper grade in crossing the Rockies eastbound is 1.8 per cent on the west slope. This grade is 13.59 miles long. The ruling grade, however, is 0.8 per cent extending generally, but with short interruptions, from Whitefish to Nimrod, a distance of 54 miles, the total distance from Whitefish east to the summit of the pass being 68 miles. Westbound from Cut Bank to Summit, 58.7 miles, the maximum and ruling grade is 1 per cent, the longest stretch of which is 14 miles. The sharpest curves on the west slope are 10 deg., of which there are 1.6 miles, with 28.6 miles of total curvature, of which 77 per cent is of 1 deg. to 6 deg. On the east slope there is a total of 16.76 miles of curvature, of which 84 per cent is of 1 deg. to 4 deg., with 0.11 miles of the maximum curvature of 8 deg. The maximum curvature over the 1.100 miles from St. Paul to Glacier Park is 4 deg.

Kalispell Division, the "Little Neck of the Bottle"

As far as motive power considerations are involved, this district, on account of its grades. etc., is the "neck of the bottle" for that part of the Great Northern between Wenatchee, Wash., and St. Paul, Minn., a distance of 1,630 miles. Whatever tonnage can be handled on this district can be moved more readily and without question over the balance of the distance. The management for some time has been aiming at a 4,000-ton train unit as the foundation of the freight train operation from Wenatchee east. The setting of this goal in itself marked a big step forward, as previous to the advent of the heavy 2-10-2 type locomotives, known as Class Q-1, in the late fall of 1923, the maximum tonnage per train over the Rockies was limited to 3,000. This proposed increase of 33⅓ per cent in train weight brought up other important considerations, such as strength of draft gear, length of passing sidings, time over the division, etc., and hence the problem was not merely a question of providing a locomotive of sufficient capacity.

The eastbound freight traffic on this division is practically all loaded, while westbound there is a considerable but varying percentage of empties. Because of this and the higher maximum grade (1.8 per cent), the motive power requirements are more exacting for the eastbound movement. For these eastbound tonnage trains the heaviest locomotives in the service of the railway are used; and at the time of this writing, 2-10-2 and 2-8-8-2 type locomotives are employed as the road engines, while on the helper grade 2-8-8-0 type locomotives (Class N-2) are used. These were originally Mallet compounds (Class N-1), built by the Baldwin Locomotive Works in 1912. and since rebuilt by the railway company into four-cylinder single expansion locomotives. They develop a tractive force of 100,000 lb., and one of them is cut into a train for the 1.8 per cent grade from Walton to Summit.

The 2-10-2 type locomotives used in this road service are given trains of 3,000 gross tons, which they handle in a satisfactory manner and at good schedule speeds over the ruling 0.8 per cent grades from Whitefish to Walton. These locomotives (Class Q-1) were built by the Baldwin Locomotive Works in 1923.

In the summer of 1924, the railway company conducted on this division some tests and experiments with one of the 2-8-8-0 type Mallets (Class N-1) which has been temporarily converted into a four-cylinder single expansion locomotive, with 25-in. by 32-in. cylinders. As a compound, the high and low pressure cylinders were 28 in. and and 42 in. in diameter, respectively. From the data on train resistance and tonnage obtained by these tests, a design for a new and heavier four-cylinder single expansion articulated locomotive was developed. The railway company, through its general superintendent of motive power, William Kelly, closely co-operated with

*Article prepared for the July issue of "Baldwin Locomotives."

and assisted the builders in developing the elements of the design as well as many of the details, and during the summer of 1925 the Great Northern received from the Baldwin Locomotive Works four of these heavy locomotives, described on page 359 of the *Railway Age* for August 22. They are the most powerful single expansion locomotives so far produced by the builders, and are also the most powerful four-cylinder single expansion articulated locomotives yet placed in service on any railway in this country. They have cylinders measuring 28 in. by 32 in., with valve gear designed to cut off at 65 per cent of the stroke; driving wheels 63 in. in diameter over tires, a steam pressure of 210 lb., and a weight in working order of 594,940 lb., with 532,800 lb. on the driving wheels. The maximum tractive force exerted is 127,500 lb.

Table I—Tests of Engine 2030, August and September, 1925, Whitefish to Cut Bank—127.44 Miles*

	Hours	Minutes	Hours	Minutes	Hours	Minutes
Time on road (elapsed)	13	55	13	25	13	35
Delays	6	7	5	41	4	34
Running time	7	48	7	44	9	1
Running time, Whitefish to Walton (50 miles)	3	46	3	12	4	27
Red Eagle to Walton (15.87 miles) 0.8 per cent grade	1	20	1	20	2	1
Miles per hour Red Eagle to Walton	12		12		7.93	
Running time, Walton to Summit (18.22 miles), 1.8 per cent grade	1	22	1	30	1	47
	2 Q1 helpers		2 Q1- helpers		2 Q-1 helpers	
Tonnage out of Whitefish	60		4,487		5,007	
Tonnage out of Red Eagle	4,013		4,487		4,965	
Tonnage out of Walton	3,975		4,487		4,965	
Water used out of tender	361.522 lb.		359,440 lb.		413,168 lb.	
Fuel oil used	31,070 lb.		31,662 lb.		36,667 lb.	
Lb. of oil per 1,000 gross ton-miles	66.42		60.78		63.03	
Steam temperature	640 deg.		630 deg.		645 deg.	
Average boiler pressure	205 lb.		207 lb.		207 lb.	
Weather	Light rain Whitefish to Glacier Park		Light rain, Walton to Glacier Park		Light rain Glacier Park to Triple Divide	

*Since these tests were made, the line has been revised at three points, shortening the distance 0.49 miles.

Simple Articulated Locomotives Successfully Handle Large Tonnage

These locomotives, known as the Great Northern's Class R-1-S, were designed to handle trains of 4,000 gross tons under winter conditions over the ruling grade of 0.8 per cent compensated, with maximum curves of 10 deg.; and although the original intention of the railway was to use them as helpers on the 1.8 per cent grade, they have been successfully employed for the greater part of the time since being received, in road service. How well they have met requirements is fully attested by their record and by the results of trial runs made shortly after being placed in service. The results of these trials are given in Table I.

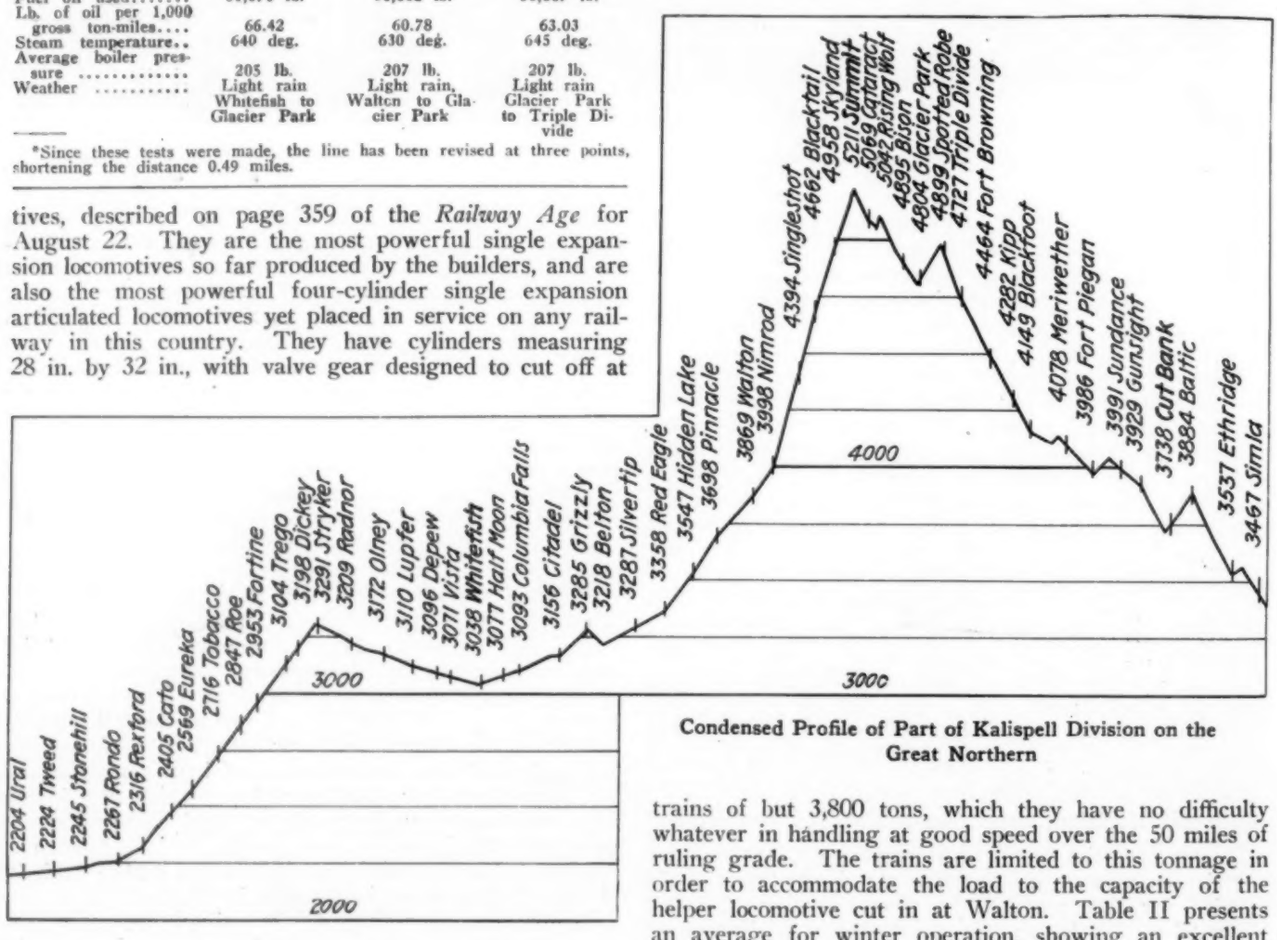
Indicator cards taken during the tests show a remarkably equal division of power between the front and rear pairs of cylinders, a typical pair of cards showing:

Boiler pressure ..... 204 lb.
Miles per hour 14.24

Front engine		Back engine	
Mean effective pressure	103.59 lb.	Mean effective pressure	104.16 lb.
Indicated horsepower	1569	Indicated horsepower	1578

From these trials it will be seen that the goal set—a minimum of 4,000 tons over the 0.8 per cent grade—has been considerably exceeded.

Under winter conditions these locomotives are given trains of but 3,800 tons, which they have no difficulty whatever in handling at good speed over the 50 miles of ruling grade. The trains are limited to this tonnage in order to accommodate the load to the capacity of the helper locomotive cut in at Walton. Table II presents an average for winter operation, showing an excellent performance:



Condensed Profile of Part of Kalispell Division on the Great Northern

Table II—Winter Average Operation

Train: 3,792 tons, 81 loaded cars and 4 empty cars, total train averaging 85 cars.

	Running time
Whitefish to Cut Bank—127.44 miles	10 hr. 7 min.
Average miles per hour	12.6
Fuel consumed—total per trip averaged	3,844 gal.

The typical round trip shown in Table III, from Whitefish to Cut Bank and return, which it was the writer's pleasure to make, was exceptional only in that it happened to be unusually free from delays due to traffic inter-

ferences. The weather conditions were good, the engine and train were handled with intelligent skill, and the entire trip was a businesslike performance. There was no special preparation or selection of the locomotive, the train and engine crews and engine taking their regular turn on the board. No special instructions were issued, and the dispatching and running of the train were done in the regular routine of business, with no knowledge on the part of the operating department that the performance of the locomotive on this particular trip was under observation.

TABLE III—A TYPICAL ROUND TRIP

Engine No. 2031, March 19, 1926—Whitefish to Cut Bank: Train, 79 loaded cars, 3,800 tons.

From	To	Distance in miles	Grades, per cent	Elapsed time	Running time	Miles per hour
Whitefish.	Walton...	50.02	0.8	3 hr. 5 min.	2 hr. 55 min.	17.16
Walton...	Summit..	18.22	1.8 (N-2 helper No. 2001)	2 hr. 25 min.	1 hr. 55 min.	9.5
Summit...	Cut Bank	59.20	0.8 generally down	3 hr. 55 min.	3 hr. 10 min.	18.7
Total.....		127.44		9 hr. 25 min.	8 hr. 0 min.	15.9

Fuel Consumption, Road Engine No. 2031 only.

Whitefish to Walton.....	1607 gal.
Walton to Cut Bank.....	1721 gal.
Total.....	3328 gal.

Return trip, Cut Bank to Whitefish.
Engine No. 2031, Class R-1-S, March 20, 1926.
Train, 55 loaded cars and 30 empty cars, 2,800 tons.

From	To	Distance in miles	Grades, per cent	Elapsed time	Running time	Miles per hour
Cut Bank.	Summit..	59.20	1.0	3 hr. 50 min.	3 hr. 40 min.	16.1
Summit...	Walton...	18.22	Down	1 hr. 35 min.	1 hr. 20 min.	13.66
Walton...	Whitefish.	50.02	Down except 3 miles of 0.6	3 hr. 15 min.	2 hr. 30 min.	20.0
Total.....		127.44		8 hr. 40 min.	7 hr. 30 min.	16.9

Fuel consumption, 2,987 gal.

These locomotives are making a remarkably uniform and excellent performance record, and in this respect are benefited by assigning them to regular engine crews. Assigned power, it should be mentioned, is a general and standard practice on this road.

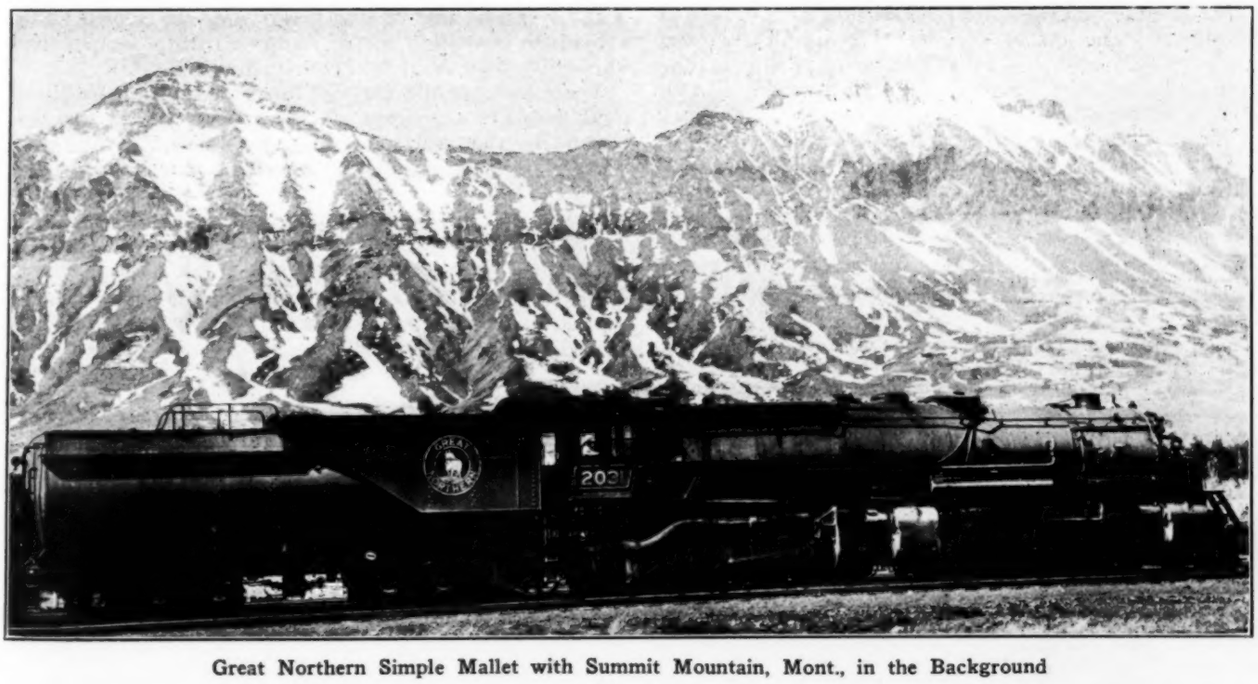
Maintenance work required of the roundhouse forces has been exceptionally light for engines of this size and power. Especially satisfactory service is being obtained from the main and side rod bushings, all of which are of the floating type. The rear end of the main rod is solid. No trouble has been experienced from either hot driving boxes or crank pins.

Maintenance Work Exceptionally Light

Owing to the frost, fog and mist frequently encountered in the Rockies, and to tunnels and snowsheds, rail conditions at times are bad. The comparatively high ratio of adhesion of these locomotives (4.18), aided by the fact that the maximum cut-off is limited to 65 per cent of the stroke, is of great importance, as slipping of either the head locomotive or the helper during the slow drag up the 1.8 per cent grade often results in break-in-twos. These locomotives have shown that they hold the rail well and are not slippery. They ride well and are especially comfortable at the higher speeds, and there is no exaggerated lateral oscillation so often noticeable in the front unit of a Mallet locomotive.

The new locomotives have a tractive force 46½ per cent greater than the Class Q-1 (2-10-2 type) locomotives which they are at present replacing in road service, but as there are but four of them, it is necessary that they be supplemented by the Q-1 engines to the extent required by the varying volume of traffic. It has been demonstrated that they have ample reserve capacity when handling 4,000 tons under winter conditions, while it is possible under summer conditions to haul 4,500 tons at a reasonable schedule; with this latter tonnage, however, it is necessary to use one of these engines or its equivalent as the helper up the 1.8 per cent grade.

The trans-continental traffic of the Great Northern is quite constant during the nine-month period extending from December to August, and at that time of year consists very largely of forest products. During the months of September, October and November there is superimposed on this more or less constant traffic an extremely heavy peak business, consisting principally of fruit moving from the Wenatchee district to the east. During the nine-months' period referred to, while good time is important, sufficient speed can be made with full tonnage



Great Northern Simple Mallet with Summit Mountain, Mont., in the Background

trains; and it is, therefore, the practice of the railway to use the four single expansion articulated locomotives in road service.

In the three fall months when the peak business is being handled, the character of the commodity loaded, namely fruit, makes a smaller train unit and faster schedule imperative; during these three months the four engines under consideration are placed in helper service on the west slope, and all road service is performed by the Class Q-1 locomotives. The use of these heavy locomotives as pushers at this time of the year enables the road to make a fast schedule through this mountain district.

Railway Magazine Editors Meet at St. Paul

THE fourth annual meeting of the American Railway Magazine Editors' Association was held at St. Paul, Minn., on June 3 and 4, with an attendance of 100, including 62 staff members from 49 railway publications in the United States and Canada. The circulation of the magazines represented totals 1,400,000 and reaches nearly three-quarters of the railroad population of America. The meeting was devoted entirely to subjects designed to increase the efficiency of the publications and to aid in the general program for closer relations among the railroads, their employees and the public whom they serve. A banquet was held on the evening of June 3, the speakers including Ralph Budd, president of the Great Northern; Herbert Randolph Calt, managing editor of the St. Paul Dispatch and Pioneer Press, who spoke upon the "Newspapers and the Railroad; Harper Leech, industrial editor of the Chicago Tribune, who presented the subject "The Power of Printed Friendliness," and Charles E. Morris, assistant to the chairman of the Western Railways' Committee on Public Relations, who outlined the opportunities of the railway magazine editor.

Officers elected for the ensuing year were president, C. W. Y. Currie, managing editor of the New York Central Lines Magazine, New York; first vice-president, W. E. Babb, editor, Rock Island Magazine, Chicago; second vice-president, W. N. S. Ivins, editor, Great Northern Magazine, St. Paul, Minn.; and secretary-treasurer, Miss Margaret Talbott Stevens, associate editor, Baltimore & Ohio Magazine, Baltimore, Md. K. D. Pulcipher, editor of the Pennsylvania News, Chicago, was elected chairman of the executive committee.

The fall meeting will be held in Savannah, Ga., at a date to be set later.

Mr. Budd, in his address at the dinner, heartily endorsed the railway magazines and complimented the editors for the work they are accomplishing in bringing about a better understanding between railroad employers and employees. "We are living in an industrial age, an age of steam, electricity and mechanism. This age would not be possible without the great aggregation of capital, organized into mammoth corporations which direct the labor of large groups of employees. Without this amassing of capital it would be impossible to produce many things on the market today at fair prices. Paramount among these are transportation facilities. Labor is the largest and most important factor which enters into transportation."

The committee on the future activities of the Association recommended that two meetings, one in the summer and one in the fall, he continued. These meetings should be conducted along specific lines in order to secure the greatest amount of good. The two-day session in the summer should be devoted exclusively to the consideration of the particular job at hand, that is preparing employees' publications and subjects closely allied. The fall meeting should be of but one day's duration and should be devoted to the railroad subject as a whole from a national standpoint with reference to individual lines only where specific instances warrant. It was felt that the work of the Association could be made of material assistance to each editor if in addition to arranging for the inspiring talks of prominent people, committee research work be done during the interim and presented at the summer meeting. The committee recommended that for each summer session one or two major subjects be listed and a comittee consisting of not more than three or possibly four editors make a report on them.

The committee did not feel that standardizing publications would be practicable since each editor is necessarily bound by the policy of his own railroad. Through standardization the individuality of the publication would also be lost.

It was felt by the committee that each editor whose magazine has space for railroad fiction should do his utmost to encourage and develop it and lift it out of the amateur class through his professional guidance.

Built in the Canadian National's Winnipeg Shops

Will Air Transport Become a Serious Competitor?*

Studies of costs and potentialities indicate that it may, particularly over long distances

By Archibald Black
Consulting Air Transport Engineer

DISCUSSION of the place of aircraft in the whole scheme of transportation involves a certain amount of prediction, as air transport is now only coming into existence. Predictions, always dangerous, are particularly so in the aeronautical field with its peculiar faculty for giving constant surprises. However, there is much to be gained from peering into the future possibilities even though the glasses which we have to use may be somewhat clouded. At least we have some knowledge of the limitations and capabilities of aircraft by which we may be guided and we have some parallel in other developments which have long since become history. The chief characteristics of most attempts to discuss future utilization of aircraft is in their visionary nature. Aircraft development has made available a medium of transport which, for the first time, is independent of the age-old barriers of land and water. The frontiers of nature have been eliminated. The tremendous field of possibilities which this opens up stirs the imagination and makes it less easy to keep within the bounds of the cold, hard facts which are going to determine the future course of its development.

Demand a Question of Education

Air transport lines are not quite out of the experimental stage although several years have passed since the first was initiated. So far as commercial *operating* experience is concerned it is true that the airplane and airship are far from being experiments. With the business side, however, the story is quite different. Very few airlines in the world are actually paying their way and operations are usually continued through the assistance of heavy subsidies. This would be most discouraging were it not that traffic is growing, deficits decreasing and indications pointing steadily to elimination of artificial support in the near future. It has been thoroughly demonstrated that the success of air transport depends as much upon education of the public to its use as upon its technical perfection. Strictly speaking there is no "demand" for air transport. This, however, is no cause for discouragement; as C. M Manly very aptly put it, there was no "demand" for bathtubs a couple of generations ago. Aircraft possess certain of the elements which are valuable in transportation. The attainment of success depends upon educating the public to their use. This is a slow process but one which is proceeding as rapidly as can be expected and the results are very encouraging if we appreciate the nature of the problem.

The Origin of Air Transport

The very first air transport lines were operated with airships. The Zeppelin organization turned its attention to commercial operations at an early stage and initiated the famous "Delag" airship line in Germany in 1910. These operations were very successful from the technical viewpoint. How successful they were from the business side is largely a matter of conjecture for the operators have been quite reticent on this matter. However, the traffic carried was substantial, operations were continued over a period of some four years and considerable expansion undertaken. It may be presumed therefore that the venture was either a business success or promised to become one. These operations were interrupted by the outbreak of war in 1914 but were resumed in 1919 until stopped through restrictions imposed by the Allied governments. No airship lines are being operated in any part of the world at present but many substantial projects are under way and the near future will see a resumption of activities. Application of the airplane to transportation had been tried experimentally at various times but was first started on a practical basis in 1918 through inauguration of the U. S. Air Mail Service. (This service has been steadily expanded since, and, although generally accepted elsewhere as a world standard, its size and importance are not fully appreciated here.) The end of the World War was closely followed by initiation of commercial airplane routes throughout Europe; nearly all of the routes being very heavily subsidized by their respective governments. On account of this support Europe has made a much better showing in the operations of privately-owned air transport lines, although the United States is far ahead of any country in total mileage flown.

Economic Limits

Air transport must be considered in two general classes, airplane and airship. For commercial purposes the present day airplane is usually accepted as becoming uneconomic if the distance to be traversed without a stop exceeds some 200 to 300 miles. This condition is due to displacement of pay load by the excess of fuel necessary to operate over longer distances without an intermediate stop. Where the route is longer (and frequently where it is not) intermediate stops are made at which the airplane is given an inspection and the fuel supply replenished. The time involved in making a stop need not exceed some fifteen minutes or so. For very long distances the airship has important advantages over the airplane. The ratio of useful load to power required is higher; consequently the weight of fuel becomes of lesser importance. This makes it practicable to operate airships without stops over distances which are far beyond the maximum range of the airplane. At the same time the inherent characteristics of the airship make it desirable to design this vehicle for lower operating speeds than are commercially practicable with the airplane. To reduce the comparison to figures it might be noted that commercial airships are usually designed for a maximum speed of around 70 to 80 miles per hour. Commercial airplanes of the land type are designed for 100 to 135 miles per hour while commercial flying boats are designed for 80 to 100

* A chapter from a forthcoming book, *"Transport Aviation"* to be published by the Simmons-Boardman Publishing Company.

miles per hour. The scheduled speeds in everyday operation are naturally somewhat less than the designed maximum speeds, just as with any other vehicle. These characteristics as regards duration and speed, as well as some other considerations, tend to make the airplane the more practicable for the shorter and the airship the more practicable for the longer distances.

Fields of Airplane and Airship

So far as the airship is concerned its greatest and most immediate utility is likely to be found in transoceanic transportation of passengers, mail and light freight. As a general rule it promises most when in competition with the steamship. Where good railroad service already exists the high speed of the train usually reduces the margin of time which the airship could save. There are, of course, exceptions to this rule, particularly in cases where the existing railroad is not a very direct line or where the distance is very great. Possibly an ideal airship route from the point of view of competition and traffic might be one operating between New York and London. Strange to say no such route has been planned but the Germans have been working on a project to operate between Spain and South America. The airplane finds its greatest utility as a means of transport over much shorter distances such as London to Paris, Key West to Havana, Cleveland to Detroit or New York to Chicago. The airplane promises much as a competitor of the steamship for short distances and as a competitor of the railroad over longer distances where intermediate stops can be made.

Present Air Traffic

The class of traffic which the airplane is now carrying (and which the airship carried when operated) is divided between passengers, mail and small packages. The actual division varies so greatly for different routes that no generalities can be made as regards the proportion of each which goes to make up the total revenue. Even if this information were available it would be rather misleading just at this time when deficits are made up by subsidy. As a rule privately-operated lines have found that the greater part of their earned revenue was derived from passenger fares. However, our operating experience has been so limited to date that this condition is liable to change as the mail and package traffic builds up. The cost of operating either airships or airplanes is well above that of older means of transport at present. While this cost decreases very rapidly with increased operations, it promises to remain a more expensive means of transport for many years. Consequently, in each class of traffic the sales appeal must be made on the strength of offering faster service at higher cost. Small scale operations without government subsidies (such as the routes which are to begin operating in the United States in the summer of 1926) make unit operating costs very high. Thus passenger traffic can be attracted only when the distance is short and the amount of the excess fare does not become such a serious item.

Plans of American Airlines

In the case of mail and packages the costs are also increased in the same proportion but the actual sum involved per package is usually small. In the case of mail the sum involved, while a high percentage, is insignificant unless the volume is exceptionally great. At the same time the saving in transit may be of very great importance to the sender. Consequently many airlines within the United States plan to depend chiefly upon mail and packages for their revenue at first. The exceptions to this rule usually occur where the distance is comparatively short. As the scale of operations grows it should be possible for these operators to steadily decrease their rates for mail, packages and passengers. While such reductions will increase the traffic in each class it seems certain that the greatest effect will be found in the case of the passenger volume. The upbuilding of public confidence through continued operation of the routes will also work to increase the passenger volume through elimination of fear. Some of the groups organized to begin operation next summer appreciate this so well that they have announced their intention of carrying *no* passenger traffic for the first few years. They will begin by carrying mail and packages and will enter the passenger field only after their lines have become firmly established.

Readjustments in Traffic

While difficult to foresee the exact course which air transport development will take, it appears certain that the first effect will be gradual transfer of mail transportation from steamship and railroad to airship and airplane. This change should continue until all through mail is thus carried. The local and short distance mail is not so likely to be affected. The telegraph companies' "night letter" service promises to be very seriously affected for distances of less than about 1,000 miles. For longer distances the "night letter" should retain its advantage over the air mail letter. Coincident with this change we may reasonably expect to witness the development of an entirely new class of shipment which might be called the "air express" package. This class may be drawn partly from present parcel post and railway express and it may be partly an entirely new class of material which otherwise would not be shipped at all. Certain perishables would be likely to form part of the new class. "Flowers by wire" might develop into flowers actually sent by air. New York morning papers would appear at the breakfast table in Chicago. And Chicago, reading the New York advertisements at the same time as the New Yorkers, might be tempted to order by mail. This may be all conjecture but it suggests possibilities. It seems very unlikely that the development of a new class of package traffic should have any important effect upon present parcel post and railway express. The natural growth of these should more than counterbalance what they might lose to a new class. This new class would seem destined to remain somewhat more expensive than the railway express even when allowances are made for future devlopments. Thus the two classes might continue indefinitely, one going by air, the other by rail and steamship.

Possible Passenger Traffic Development

In the case of passenger traffic a somewhat different state of affairs is promised. Of course the railroad should continue to hold its own for local and suburban traffic where the distance is short. For longer distances the airplane and airship promise to cut seriously into this class. At first passenger traffic by air will be in the de luxe class and will resolve itself into selling higher speed at a cost which is in some proportion. Increased scale of operations of airplanes and airships, as well as future developments in these, are certain to cut operating costs radically. The indications already are that passenger fares may closely approach the extra-fare-train rates as soon as we reach reasonably large scales of operation. By the time this condition is attained a substantial volume of passenger traffic is sure to have become diverted to the air. It may even become advisable for the railroad and steamship to cease catering to the high class passenger traffic, abandoning it in favor of the slower, cheaper and local traffic. This would suggest that the railroad train may ultimately be confined to heavy freight; express companies' shipments; suburban and local passenger service.

While this picture is admittedly many years away, it does look like the ultimate division to those who have studied the possible development of air transport.

Co-operation and Co-ordination

During the development period a state of close co-operation between the old and the new means should grow up. Such co-operation seems to offer just as much advantage to the airplane and the airship as it does to the motor bus, motor truck, railroad train and steamship. Even today instances can be cited where close co-operation exists. Airplanes are being used to advance ship connections with mail at the mouth of the Mississippi and other places. Motor buses or automobiles are being used to transport passengers between the city and the landing field by most of the European air transport lines. Railroads are used to carry passengers by night in conjunction with airplanes by day on account of the difficulty of providing berths in the latter vehicle. Indeed, close co-ordination with the older forms of transport seems to be essential to the successful development of air transport. When air transport has been more firmly established the railroads and steamship lines may be ready actually to take part in its development. The development of the motor bus is now establishing a precedent in this respect and the story may be repeated in air transport.

Reading to Lease Lehigh & New England

Acquisition will round out system and make available independent outlet for coal traffic to New England

ANNOUNCEMENT was made on June 5 that the directors of the Lehigh & New England had authorized the leasing of their property to the Reading Company subject to the approval of the Interstate Commerce Commission and the stockholders of the respective companies. The term of the lease is to be 999 years and the Reading is to take over the operation of the Lehigh & New England on January 1, 1927. The amount of the rental to be paid was not made public, but it is understood to be in excess of $1,000,000 annually.

The Lehigh & New England is owned by the Lehigh Coal & Navigation Company. It operates a total of 219 miles of line, 176 of which it owns, 7½ of which it leases and 36 of which is operated under trackage rights. It serves anthracite coal operations in the Schuylkill field in the neighborhood of Tamaqua, Pa., and extends in a northeasterly direction crossing the Delaware River into New Jersey at Portland, Pa., and after crossing the northern part of New Jersey reaches into New York at a terminus at Maybrook. At this point it connects with the Central New England and with the Poughkeepsie Bridge route into New England. The mileage includes a number of small branches which reach such points in eastern Pennsylvania as Bangor, Bath, Bethlehem, Allentown, Slatington, etc. The Lehigh & New England forms one of two connections between the several hard coal carrying roads and New England via the Poughkeepsie Bridge.

The other of the two is the Lehigh & Hudson River which lies south of the Lehigh & New England and parallels it between the Delaware River at Easton and Maybrook. In the past the Lehigh & Hudson River has been the road which has seemed more available as a purely connecting link, on account of the fact that it is owned jointly by the Lackawanna, the Lehigh Valley, the Erie, the Pennsylvania, the Reading, the Jersey Central and also the Lehigh Coal & Navigation Company. Presumably the acquisition of the Lehigh & New England by the Reading Company will prove of greatest value to the Reading System in that it will give the system a connection over its own rails between its own territory and New England. This should be of particular value to the Reading System because of the large volume of both anthracite and bituminous coal which moves into New England over the Poughkeepsie Bridge.

The Lehigh & New England has three principal items of traffic which together furnish about 83 per cent of the total revenue tonnage and from which is derived three-quarters of its total operating revenue. It carries practically no passenger traffic. The three principal commodies carried are anthracite coal, bituminous coal, and cement. In 1925 anthracite constituted 36.2 per cent of the total tonnage and supplied 36.67 per cent of the total operating revenues. Bituminous was 26.8 per cent of the tonnage and supplied 17.34 per cent of the revenues while cement constituted 20.5 per cent of the tonnage and supplied 22.54 per cent of the revenue. Table I is a statement of the tonnage of these commodities in the years from 1916 to 1925. It is notable that the anthracite tonnage has not tended to increase but that the bituminous tonnage has in the ten-year period increased three times or more, while the cement tonnage has almost doubled.

TABLE I—LEHIGH & NEW ENGLAND—CLASSIFICATION OF TONNAGE

	Anthracite	Bituminous	Cement	Total all freight
1916	3,623,274	59,641	899,734	6,505,825
1917	4,464,891	586,473	905,570	7,469,662
1918	4,502,059	513,703	732,012	7,196,055
1919	3,561,156	1,199,827	920,862	6,749,758
1920	3,808,069	1,051,975	756,392	6,881,496
1921	2,840,356	1,492,643	810.307	5,943,780
1922	2,579,470	1,603,634	1,249,867	6,327,114
1923	4,100,586	1,389,328	1,471,985	8,148,032
1924	2,975,142	1,605,733	1,543,525	7,300,717
1925	2,879,419	2,135,536	1,630,664	7,952,265
1925—Proportion of total tonnage	36.2	26.8	20.5	100.
1925—Proportion of total operating revenues	36.67	17.34	22.54	97.89

The road in 1925 carried the largest tonnage in its history with the single exception of 1923. It had an operating ratio of 76.88 and a ratio of transportation expenses to total operating revenues of 32.66. Its 1925 net income was $683,647 which was equivalent to $5.02 a share on the 6,800,000 $50 par value capital stock. Net income in 1924 was $859,980 or $6.32 a share. The company's funded debt, inclusive of equipment trust obligations, totals $6,915,000.

President A. T. Dice of the Reading has already made the announcement that the Reading's traditional "open-

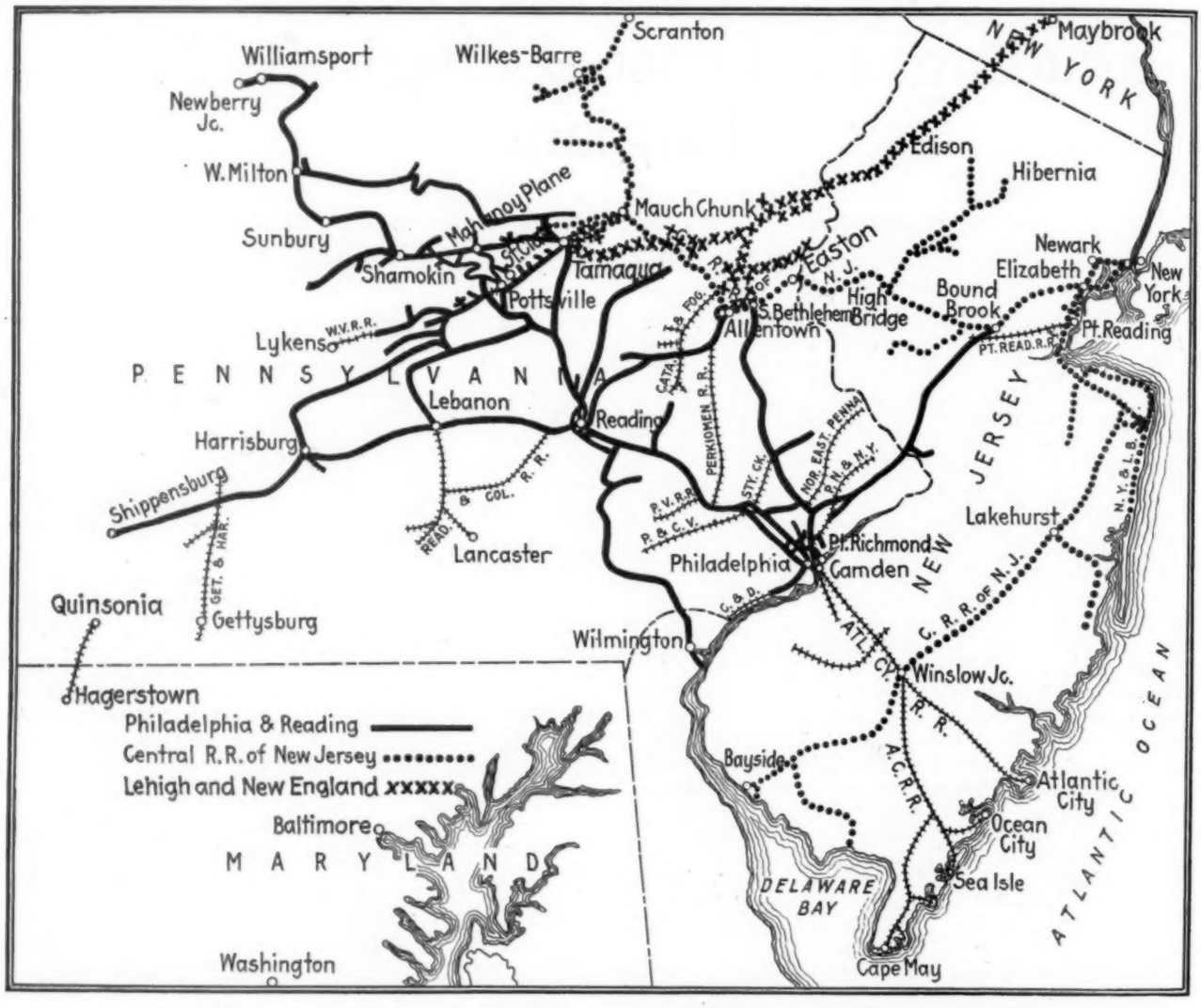
door" policy at all connections will be maintained over the Lehigh & New England route.

Navigation Company Retires from Railroad Business

At the same time the announcement was made of the lease of the Lehigh & New England by the Reading it was also announced that the directors of the Lehigh Coal & Navigation Company and the Central of New Jersey had authorized the execution of an agreement settling pending controversies concerning leases of the properties owned by the Navigation Company and leased to the Central. In addition to the Lehigh & New England, the Navigation Company owns the Lehigh & Susquehanna, tals as the price of its retirement from the railroad business.

The Reading System

The Reading Company as at present organized operates 1,150 miles of railroad, 547 of which it owns, 562 of which it leases and 40 of which is in the form of trackage rights. It has already been noted that the Lehigh & New England will add an additional 219 miles leased. In addition to the mileage mentioned the Reading also controls through ownership of stock an additional 1,103 miles, the larger share of which is constituted in the Central of New Jersey. The other properties include



The Relation of the Lehigh & New England to the Reading Company and Its Controlled Lines

the Nesquehoning Valley, the Tresckow and the Wilkesbarre & Scranton, all four of which it leases to the Central of New Jersey.

The new agreement provides for a new rental of $2,267,801 for the first three properties named and in addition a rental of $66,606 annually for the Wilkesbarre & Scranton. With the approximately $1,000,000 which the Navigation Company will receive for its lease of the Lehigh & New England, this means that the Navigation Company will receive annually about $3,350,000 in rentals as the price of its retirement from the railroad business.

The Reading System

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Coal Traffic

The Reading is familiarly known as the country's largest carrier of anthracite coal. It is not so generally known that it carries considerably more bituminous coal than it does anthracite. Normally the ratio of bituminous to anthracite is about 3 to 2. In 1925, when there was

no anthracite mined for the last four months of the year the soft coal tonnage was nearly double the hard coal tonnage. The Reading originates none of its bituminous tonnage. It receives the larger share of it from mines on the Baltimore & Ohio, the coal reaching the Reading at Shippensburg after coming from the B. & O. via Cherry Run and the Western Maryland or via Martinsburg and the Cumberland Valley. Some bituminous also is received from the New York Central at Newberry Junction or Williamsport. The coal, whether anthracite or bituminous, has four principal outlets. One, of course, is the thickly settled and highly industrialized territory served by the company's own lines. A second is the important terminal development at Port Richmond on the Delaware river near Philadelphia. A considerable portion of the tonnage moving through Port Richmond is consigned to New England and the Reading maintains a large fleet of barges and tugs which transport the coal —anthracite or bituminous—to such ports on the New England coast as Boston, Portland, Bangor, etc.

A similar although smaller terminal development is located at Port Reading in New Jersey opposite Staten Island. This port supplies fuel to New York harbor and a large tonnage is moved by water to points on Long Island Sound. The fourth outlet is the Central of New Jersey with which the principal point of connection as far as coal business is concerned is Allentown. Much of the tonnage moving via this outlet stays on the Central of New Jersey only as far as Phillipsburg where it is turned over to the Lehigh & Hudson River for movement into New England over the Poughkeepsie Bridge. This route will now be supplemented—possibly largely displaced in importance—by the acquisition of the Lehigh & New England. The Reading has in recent years built up a sizeable business in grain. It receives this commodity largely from the New York Central at Newberry Junction and moves it through Port Richmond, although a fair volume of the grain traffic also moves on occasions to Baltimore via Gettysburg and the Western Maryland. Finally, it should be appreciated that the Reading maintains an extremely satisfactory fast freight service, a notable feature of which is the service from Philadelphia to the west via Allentown and the Lehigh Valley.

Traffic Fails to Increase

It was not so many years ago that the Reading was predominantly an anthracite coal carrier. Thus in 1895 anthracite constituted over 55 per cent of the total tonnage; in 1900 the percentage was only 38 per cent, in 1924 it had been reduced to 21 per cent and in 1925 it was only 18 per cent. There was considerable surprise when the 1925 earnings figures were made known and it was discovered that in spite of the four months (figuring to December 31) suspension of anthracite mining, the Reading had a larger net income after interest and other charges than in 1924. Of course, this fact becomes less surprising when it is learned that anthracite now makes up only about a fifth of the road's tonnage. It will be understood, however, that the Reading did not break any records in 1925. That it did extremely well is indicated by the fact that its net railway operating income (or net after equipment and joint facility rents but before the deduction of fixed charges) and also its net income after interest and other charges were the best in its history with a single exception which was 1923. This good result was obtained even though its freight ton-miles were less than in 1916, 1917, 1918, 1920 or 1923 and its revenue passenger miles were less than in any year since 1916 with the single exception of 1922. The following is an interesting picture of Reading traffic from 1916 to 1925:

TABLE II—PHILADELPHIA & READING—CLASSIFICATION OF TONNAGE

	Merchandise	Anthracite	Bituminous	Total
1916	31,808,421	13,867,075	21,016,559	66,692,055
1917	32,548,033	16,239,859	22,549,852	71,337,744
1918	30,918,224	16,277,781	24,078,596	71,274,602
1919	26,074,519	13,815,370	23,320,573	63,210,462
1920	29,716,679	15,121,124	24,875,761	69,713,564
1921	18,695,337	13,834,398	17,433,809	49,963,544
1922	23,999,339	10,299,383	16,279,928	50,578,650
1923	32,135,558	14,933,342	23,071,789	70,140,689
	READING COMPANY			
1923	32,155,450	14,933,342	23,071,789	70,160,581
1924	28,859,386	13,050,187	19,921,092	61,200,665
1925	29,976,987	11,589,089	22,488,706	64,054,782
1925—Compared with	Dec., per cent	Dec., per cent	Inc., per cent	Dec., per cent
1916	5.7	16.5	7.0	3.8

It will probably surprise many readers to learn with further reference to the trend of traffic that the tonnage of merchandise in 1925 was 5.7 per cent less than in 1916; that the anthracite tonnage was 16.5 per cent less; that the bituminous tonnage while 7 per cent greater than in 1916 was less than in 1917, 1918, 1919, 1920 and 1923 and that the total tonnage was 3.8 per cent less than in 1916. Under the conditions it is probably all the more noteworthy that the Reading came through 1925 so well, although it is nevertheless quite clear that the Reading in common with nearly all the anthracite carriers has so diversified its interests that its fortunes do not now depend so markedly on anthracite coal as might formerly have been the case.

To complete the record it might be added that the tonnage of bituminous in 1925 was 16.58 per cent in excess of that of 1924 while the tonnage of anthracite was 11.20 per cent less. The total revenue tons showed an increase of 4.66 per cent while the revenue tons one mile increased 5.22 per cent. However, the freight revenues increased only 0.43 per cent, and inasmuch as passenger revenues decreased 3.01 per cent there was a decrease in the total operating revenues of 0.64 per cent. This decrease amounted to $591,879. However, operating expenses were decreased $1,673,401 or 2.38 per cent, so that there was an increase in net operating revenues of $1,081,162 or 4.96 per cent. The savings were principally in charges for repairs to freight cars and in fuel. The 1925 operating ratio was the lowest reported since the beginning of federal control with the single excep-

TABLE III—READING OPERATING RESULTS, SELECTED ITEMS, 1916 TO 1925

Year	Mileage	Revenue ton miles	Revenue passenger miles	Rev. per ton mile cents	Total operating revenues	Total operating expenses	Net operating revenues	Operating ratio	Net railway operating income	Net after charges	Net charges for additions and betterments
1916	1,127	6,786,189,000	377,465,000	0.7127	60,452,869	34,879,459	25,573,410	57.7	.....	14,656,915	.....
1917	1,127	7,398,550,000	408,946,000	0.7194	66,831,398	46,699,283	20,132,115	69.88	.....	8,500,649	3,809,937
1918	1,127	7,428,639,000	414,112,000	0.873	80,769,564	65,889,372	14,880,192	81.58	11,298,842	10,350,021	6,892,099
1919	1,127	6,648,922,000	510,774,000	0.848	72,871,823	64,608,174	8,263,649	88.66	3,083,280	4,004,533	4,527,075
1920	1,127	7,172,042,000	500,549,000	1.059	94,819,755	89,486,240	5,333,515	94.4	—655,107	9,010,790	2,718,647
1921	1,127	5,092,560,000	409,500,000	1.367	84,924,228	68,361,308	16,562,920	80.6	12,805,667	6,496,384	3,084,585
1922	1,127	5,014,030,000	395,176,000	1.334	81,934,751	62,055,322	19,879,429	75.74	14,328,714	7,896,552	1,845,450
1923	1,125	7,332,949,000	429,610,000	1.194	104,948,371	76,735,656	28,212,715	73.12	21,813,109	16,908,865	3,173,118
					READING COMPANY						
1923	1,149	7,338,325,000	429,683,000	1.204	105,807,431	76,758,909	29,048,522	72.5	26,655,425	25,386,171	.....
1924	1,148	6,197,331,000	413,498,000	1.241	92,088,258	70,306,556	21,781,702	76.35	18,967,741	15,121,316	7,641,442
1925	1,139	6,521,036,000	400,960,000	1.174	91,496,379	68,633,516	22,862,864	75.01	20,354,629	17,159,619	13,799,016

Standard return for operations during federal control or average annual net operating income for three years ended June 30, 1917, $15,868,331.

tion of 1923. The 1925 figure was 75.01. It compared with 76.35 in 1924 and with 72.5 in 1923.

Progressive Management

The Reading in 1925 had net income after charges of $17,159,619 which was equivalent after allowance for the preferred dividends to $10.25 a share on the $50 par value common stock. Net income in 1924 was $15,121,316 or $8.80 per share on the common stock. The Reading is a somewhat peculiar property because of its being such a combination of an originating carrier (anthracite), of a bridge carrier and a terminal carrier (bituminous and other traffic). Its operating statistics suffer because of its many branch line operations and the large proportion of terminal business. However, it evidently has an extremely progressive management that knows how to overcome the disadvantages on the one hand and to take advantage of its strategic position on the other. It seems reasonable to regard the acquisition of the Lehigh & New England as an evidence of its "being on the job" because that road also lies in a strategic position and was desired by others. But most important is the fact that the Reading is able to report most satisfactory earnings even without an increase in its traffic in recent years. Indeed it is not so surprising that there should be so much rivalry concerning the allocation of the Reading in the consolidation plants. The New York Central and Baltimore & Ohio between them now have a controlling interest in the property. The question always will be whether the one will seek to get it away from the other or whether they will decide to leave the Reading as an independent system and an acquiring line rather than as one to be acquired.

TABLE IV—COMPARISON OF SELECTED FREIGHT OPERATING STATISTICS

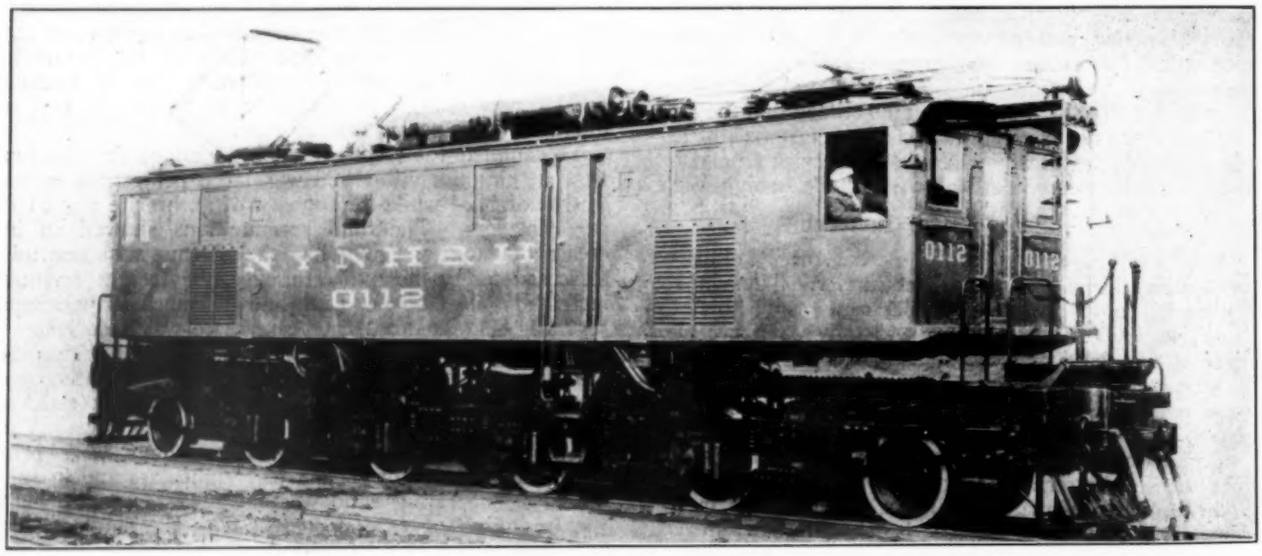
	1925	1920	Per cent of change: Inc.	Per cent of change: Dec.
Mileage operated	1,132	1,119	0.3	...
Gross ton-miles (thousands)	13,557,497	12,962,094	4.5	...
Net ton-miles (thousands)	6,901,945	7,298,610	...	5.4
Freight train-miles (thousands)	7,715	7,831	...	1.2
Freight locomotive-miles (thousands)	9,318	10,286	...	9.4
Freight car-miles (thousands)	323,763	286,192	14.7	...
Freight train-hours	687,713	913,086	...	24.6
Tons of coal consumed by freight locos.	1,231,347	1,543,364	...	20.2
Car-miles per day	22.7	20.0	13.5	...
Net tons per loaded car	34.9	38.3	...	8.8
Per cent loaded to total car-miles	61.1	66.5	...	5.4
Net ton-miles per car day	483	510	...	5.2
Freight cars per train	42.9	37.5	14.4	...
Gross tons per train	1,757	1,655	6.1	...
Net tons per train	895	932	...	4.8
Train speed, miles per train-hour	11.2	8.6	30.2	...
Gross ton-miles per train-hour	19,714	14,196	38.8	...
Net ton-miles per train-hour	10,036	7,993	25.2	...
Lb. coal per 1,000 gross ton-miles	162	.....	...	...
Loco.-miles per loco.-day	54.4	74.4	...	26.8
Per cent freight locos. unserviceable	17.0	22.7	...	5.7
Per cent freight cars unserviceable	2.4	4.8	...	2.4

Motor-Generator Type Electric Locomotive for the New Haven

THE first of the new type electric locomotives for the New York, New Haven & Hartford has been shipped from the Erie, N. Y., works of the General Electric Company. The locomotive combines advantages of both alternating and direct current; alternating current for transmission and distribution, and direct current for operation of the traction motors.

Power is received from a single-phase trolley and, through the traveling substation carried by each locomotive, is reduced from 11,000 volts and 25 cycles to direct current at 600 volts.

The locomotive is a joint product of the American Locomotive Company, Schenectady, N. Y., and the General Electric Company, Schenectady, N. Y. The New Haven has ordered seven of this type of locomotive, five for freight service on the main line between Oak Point and New Haven, and two for yard service. When double-heading, these locomotives will function in multiple with the present single-phase locomotives.



The Locomotive Has 600-Volt D. C. Traction Motors and Receives Power from an 11,000-Volt, 25-Cycle Trolley

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W. G. LEE, president, and W. N. Doak, vice-president of the Brotherhood of Railroad Trainmen, and L. E. Sheppard, president of the Order of Railway Conductors, called on President Coolidge at the White House on June 5 to urge him to appoint the board of mediation, provided for in the new railway labor act, as soon as possible.

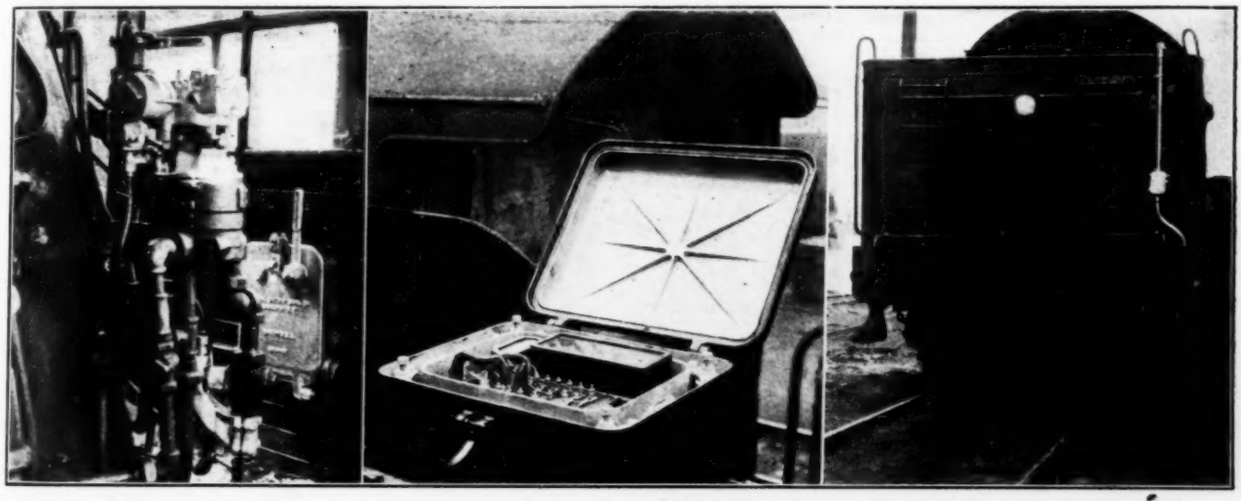
New York Central Equips Engines for Train Stop

Locomotive taken from service for 33 hours is equipped in average of 93.7 man-hours

IN order to comply with the order of the Interstate Commerce Commission and equip the locomotives operating between Buffalo, N. Y. and Cleveland, Ohio, before July 15, 1926, it was necessary for the New York Central to organize the work of equipping these locomotives with the General Railway Signal Company's intermittent inductive auto-manual train stop equipment so that the job could be handled on what may be termed a production basis. Altogether it was necessary to equip a total of 373 locomotives with this type of equipment and the work was so organized that 288 of these locomotives were assigned to be equipped at the Collinwood shops, Cleveland, Ohio, and the remaining 85 at the Elkhart, Ind. shops. After sufficient material had been received to insure the continuity of the program the work was started and the first locomotive was completed on February 6, 1926. At the time the information for this article was secured a total of 212 locomotives had been completely equipped at the Collinwood shops and the information given here pertains to the manner in which the job was handled at this point.

As a general thing it has been necessary to hold a locomotive out of service only about 33 hours in order to apply the train control apparatus. A certain number of locomotives are delivered to the shop early in the morning of each working day so that it is possible for them to be taken into the shop some time before noon of that day. These locomotives are returned to the enginehouse completely equipped with train control apparatus and ready for service at about 4 p. m. on the following day.

Inasmuch as this work involved operations which had not been done previously, it was necessary at first to make some re-arrangement of shop forces until the most effective way of handling the work was found. Four pits in the erecting shop were set aside to be occupied solely by the locomotives being equipped. At the present time the work on these locomotives requires approximately 94 man-hours, which is about 25 per cent less than was required to equip the first few locomotives. This reduction in time may be attributed to the improvement in the organization of the forces and to the increasing familiarity of the men with the work.



Engineman's Valve Actuator and Forestalling Contactor

Mechanism Case on Top of Tank Cistern

Terminal Box on Rear of Tank

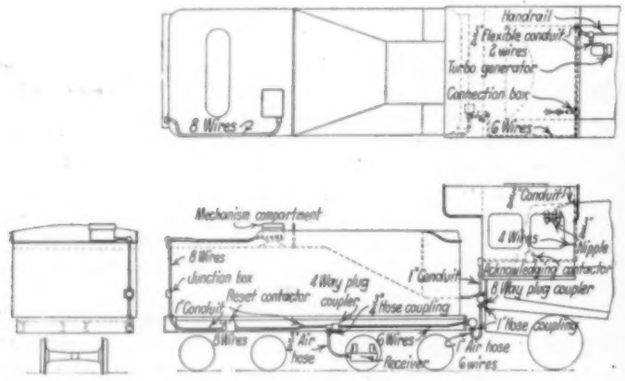
A Production Schedule Basis for Equipping Engines

To date an average of approximately four locomotives have been equipped per day. The application of this apparatus to these locomotives is handled in two ways—as they may pass through the shop for general repairs, or by their being withdrawn from service and sent to the shops for the express purposes of equipping them with the train stop apparatus. Inasmuch as the time element is relatively less important on the locomotives which are being scheduled through the shops for classified repairs, this article deals more specifically with the manner in which the work has been handled on locomotives withdrawn from service.

Various Small Jobs Included in the Installation

The equipping of the locomotives with this type of train control equipment involves the changing of the headlight generator to provide a generator of greater capacity. The particular locomotives involved in this application of train control were each equipped previously with a 500-watt turbo-generator which was replaced with one of 750-watt capacity. In addition a double bracket has to be attached to the boiler inside the cab on which the electro-pneumatic and whistle valves are mounted. A forestalling contactor is mounted on the cab side within easy reach of the engineman and the

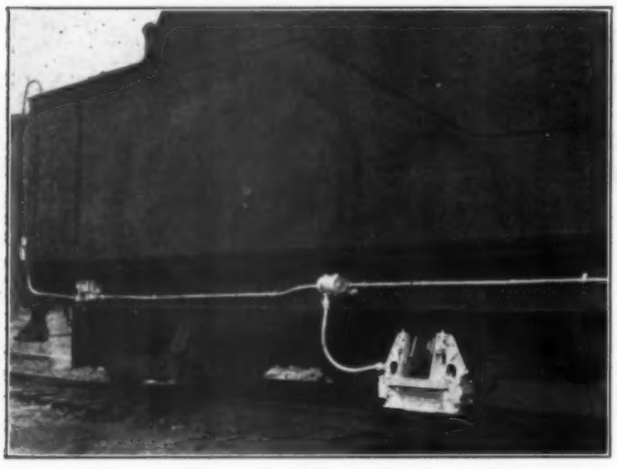
actuator is applied on the automatic brake valve. The brake valve piping is changed slightly, and the double heading valve is now located directly beneath the automatic brake valve. A fuse connecting box and terminal box are mounted on the front of the cab. A plug coupler is mounted on the rear end of the engine, on what is known as the cab bracket or tail sheet. A similar plug coupler is mounted on the front end of the tender frame



Layout Plan Showing Location of Conduit and Various Parts of Train Stop Equipment

and these together with the plug connector provide the electrical connection between the engine and the tender.

The rear journal box on the right front tender truck must be changed so as to provide for the application of a special journal box with lugs on which the receiver is mounted. A plug coupler and reset contactor together with the necessary conduit are mounted on the side of the tender frame. A plug coupler connection provides the electrical connection between the coupler on the tender frame and the receiver on the tender truck. A terminal



The Receiver is Mounted on the Rear Journal Box of the Right Front Tender Truck

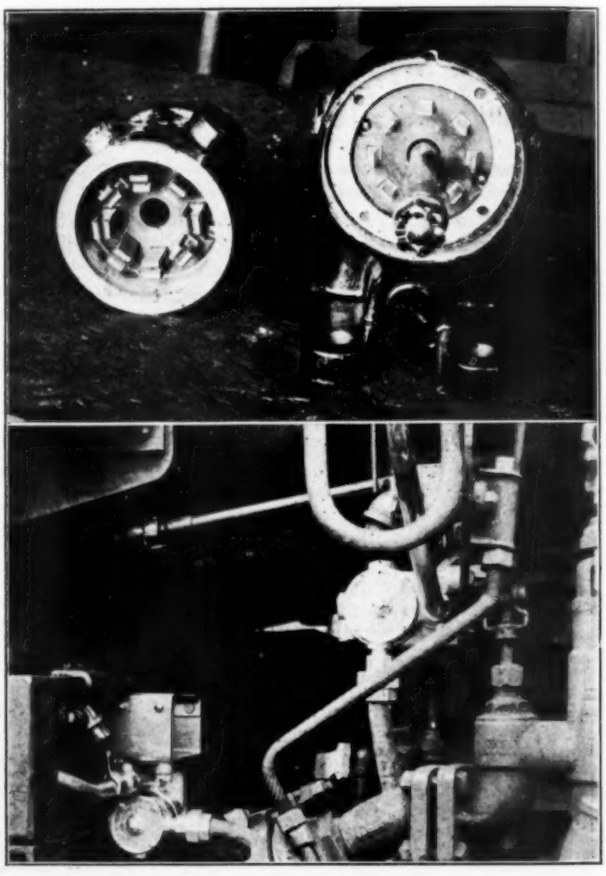
box is mounted on the rear of the tender and the mechanism box is located on the top of the tank cistern.

Work Is Divided Into Three Shifts

In order to handle the necessary work properly within the somewhat limited time, it has been necessary to divide it among men on three shifts. The first shift goes on at 4 p. m. and works until midnight; the second from midnight until 8 a. m. and the third from 8 a. m. to 4 p. m. Following is a brief outline of the work handled by the men on the above shifts:

First shift—Laying out work for application of train control conduits in cab and on tender frame, drilling holes and applying brackets on tender frame. Changing the truck journal boxes, drilling holes in cab and applying brackets for valves, changing hand rails for train control and re-wiring, fitting up receivers and couplers and testing out equipment.

Second shift—Applying brackets on the tender, applying electro-pneumatic valves and changing generators, applying conduits on tender for train control, changing conduit on tender for headlight equipment, applying conduits in cab for train control, changing



Top—An 8-Way Plug Connector—Bottom—Plug Connectors and Cable Between Engine and Tender

conduits in cab for headlight equipment and re-wiring, piping train control and making alterations in cab.

Third shift—Wiring tender and cab for train control and re-wiring tender for headlight equipment.

These locomotives are delivered to the shop early in the morning and are taken into the shop at about 11.30 a. m. where they are ready for the electrical men at 4 p. m. The electrical application work is completed and the engine ready to leave the shop the next morning at 8 a. m. for testing. Finally they are ready for delivery to the enginehouse for service at 4 p. m. From the above it can be seen why the 4 p. m. to midnight shift is considered the first shift as far as the electrical workers are concerned. A total of 93.7 man-hours is required to complete all of the work.

THE AMERICAN ASSOCIATION OF GENERAL BAGGAGE AGENTS held its annual convention at Atlantic City, N. J., on June 1, 2 and 3. The president chosen for the ensuing year is R. L. McKibbin (S.P.). The secretary is E. L. Duncan, 332 South Michigan avenue, Chicago, Ill.

Hearing on Consolidation Bill

Interstate Commerce Commission hopes to be relieved of preparing complete plan

WASHINGTON, D. C.

HEARINGS were resumed before the House Committee on interstate and foreign commerce on the Parker railroad consolidation bill on June 3, when Commissioner Henry C. Hall of the Interstate Commerce Commission appeared and presented the report of the legislative committee of the commission, signed by Commissioner John J. Esch. This stated that, subject to the comments included and some detail suggestions, the committee is "unanimous in reporting approval of the bill and expressing the earnest hope that it may speedily pass and thereby relieve the commission from the existing mandate of law that it put out as soon as may be a complete plan of consolidation." Mr. Esch added that the report had been considered by the commission and has its approval. He said that the views of the commission had already been set out in detail before the Senate committee and he repeated the "desiderata" of amendments to the present consolidation law as summed up in a draft of a bill submitted by the commission, saying: "The bill which you now submit so largely meets these desiderata, as well as the views expressed by or on behalf of other members of the commission, as to embody a betterment of existing law which is fully justified by our experience and observation." Regarding the suggested changes the report said:

The changes which we suggest for your consideration center around the provisions of this bill as to condemnation including the work assigned to this commission or a division thereof in connection with such condemnation. These provisions are found in sections 212 and 213 of the bill and are confined, as we understand, to condemnation of voting securities held by a non-assenting holder, and of property other than securities, or any right or interest in any such property, held or enjoyed without power of assignment or transfer.

As to securities, paragraph (1) of section 212 provides that any holder of a voting security issued by any carrier a party to the plan, who did not vote for the adoption of the plan, may, within 90 days after the meeting at which the holders of voting securities consented thereto, notify such carrier in writing that he does not assent, and further provides that any such holder who does not so notify the carrier within that time shall be held to have consented to the order. This does not adequately provide for the case of a holder who is legally incapacitated from acting for himself and has no legal representatives. The courts would doubtless hold that such a holder can not effectually consent, or refuse assent, or notify the carrier within the time limited. We suggest a provision to the effect that such legally incapacitated holder may give the notice within 90 days after removal of his incapacity by the appointment of a legal representative or otherwise and thereby become entitled to the relief provided for non-assenting holders. This suggestion is drawn from a statute of Massachusetts providing for the consolidation of the Boston Elevated and West End Street Railway Company.

This statute also provides that for the purposes of valuation, purchase or condemnation of non-assenting shares the value of the shares shall neither be increased nor diminished by reason of the provisions of the act or by the consolidation therein provided for. It may fairly be said that the securities of a non-assenting holder should not be enhanced or depreciated in value by reason of a consolidation to which he objects, but since valuation is a judicial, and not a legislative, function it may be that neither court nor appraiser could be bound by such a statutory provision.

In section 213 the mode of exercise of the right of eminent domain in respect of such securities, or of property other than securities held or enjoyed without power of assignment or transfer, is prescribed. In paragraphs (1) and (3) of that section the corporation is authorized to petition the court designated for appointment of the Interstate Commerce Commission as a board of appraisers, but is not in terms authorized to petition for condemnation of the securities or other property. In subdivision (4) it is made the duty of the commission "or a division thereof" upon any such appointment to act as a board of appraisers. It would seem that the words "or a division thereof" should also appear in paragraphs (1) and (3) if they are to be retained in paragraph (4). Paragraph (4) further provides that while acting as a board of appraisers the commission shall have the powers and duties of a master in chancery. If this provision is to be retained the words "or division" might well follow the word "commission."

These provisions raise the question whether the legislative intent is that the individuals constituting for the time being the commission or division thereof are themselves to perform all the duties of the board of appraisers and exercise all the functions of a master in chancery, or whether all the provisions of Title I, being the existing interstate commerce act, apply and the Commission or division may perform its duties under this section 213 by and with the aid of its organized forces of examiners, engineers, accountants, and analysts, especially those attached to our bureau of valuation and bureau of finance, to the extent that those forces are utilized in performance of our other duties under the interstate commerce act. It is hardly necessary to say that performance by the persons constituting the Commission or a division thereof of all the duties which would fall to such a board of appraisers would constitute such an addition to their duties under existing law as to be practically impossible of fulfillment. We suggest express incorporation by reference of the provisions of Title I, the substitution of the designation "Commissioners" for that of board of appraisers, and the elimination of the provision that they shall serve as a master in chancery.

Further reason for this elimination is to be found in the query which we now raise as to the provision of this bill that condemnation shall be by a suit in equity. Without assuming in this report to express an opinion on a matter of law it is not inappropriate to refer to the prevailing view that proceedings in condemnation are proceedings at law rather than in equity, usually governed by statute, or at least special proceedings in which the right to trial by jury is not disregarded. The Supreme Court has expressed the view that condemnation proceedings are proceeding at law and not in equity, a doctrine which has been repeatedly adhered to by other Federal courts, and it may be that the Supreme Court would not be controlled in its view of such a proceeding by what is here enacted. Omission of the words "in equity" in line 13 of paragraph (4) and lines 2 and 7 of paragraph (5) would thus seem to us desirable and omission of the word "other" in lines 4 and 8 before the words "suits in equity." It will be observed that provision is made for trial by jury if claimed. Similar provision is made in sec. 17 of a Massachusetts statute approved June 1, 1915, providing for consolidation of the railroad companies constituting the Boston & Maine system, and in sec. 52 of Part III of the Massachusetts General Railroad and Railway Law of 1906. It may be noted that in each of these statutes special provision is made for a holder of shares who is incapacitated from acting and has no representative.

We appreciate the great advantage of having practice, pleadings, forms and modes of proceedings prescribed by the Supreme Court, as are equity rules, with resulting relief from obligation to acquaint ourselves with the practice, pleadings, forms and modes of proceedings obtaining in the several states of the United States and the District of Columbia, and trust that this provision can be retained if the commission or its divisions are to take on the added burden of serving as officers of a court.

The duties laid by the bill upon the commision in respect of plans for unification which may be submitted by carriers would constitute in and of themselves a heavy but necessary burden in addition to the duties already laid upon us by law. From the point of view of men who must endeavor to perform all their duties, we can not but depreciate the further addition of the work of appraisers, whether the work be done by our forces under our direction or by commissioners individually. Even with the aid of our forces, if expressly authorized in the bill, it is not possible at this time to estimate in terms of time, men and money what this addition would mean. We urge that if consistent with the legislative purpose these functions of appraisers or commissioners in condemnation proceedings be left, as in the Massachusetts statutes cited, to commissioners to be designated by the respective courts. If this is not done, or can not be done, Congress should have in mind that discharge of these functions will necessitate additional appropriations for our use in amounts not yet to be estimated and may interfere with, or seriously retard, our other work. Further, if the functions of appraisers in condemnation proceedings are to

devolve upon us, whether with or without the aid of our forces, it is desirable that, in so far as possible and consistent with the jurisdiction of the federal district courts, the practice, forms and modes of proceedings in arriving at values shall accord with our existing practice, forms and modes of proceedings, especially those developed in connection with the work of our bureaus of valuation and finance.

Comes Nearer to Harmonizing Views

Commissioner Hall, who has been particularly in charge of the commission's consolidation investigation, said that the Parker bill comes nearer to harmonizing the various views of students of the subject than any he had seen, that it represents a pronounced advance in the direction of workability, and that he was glad to join with other commissioners in urging its passage as speedily as possible. He was questioned for two hours by members of the committee and asked to return again for further questioning.

When Representative Hoch asked if he considered that Congress under the transportation act had adopted a policy of consolidations, Mr. Hall replied that he construed the law as indicating the intent of Congress that a consolidation in the public interest should be furthered rather than hindered, that Congress favored rather than opposed consolidations, and that the public was looking forward to building up strong railroad systems. He said he thought the commission had never been very strongly impressed with the advantages of a complete plan and that after six years of experience and two years of hearings on its tentative plan it had come to the conclusion that there are so many alternative conclusions as to which roads could be combined to make the best systems that it would be a little hazardous to set up one as approved against other possibilities. The authority given by the bill to utilize the results of the investigation already made, and the process of education that has been going on, he said, ought to suffice to take the place of a general plan, and the commission would naturally have in mind the entire situation in passing upon a particular plan submitted to it.

Questioned by Representative Huddleston as to whether the bill adequately protects minority stockholders, Mr. Hall said his conception of the bill is that its prime purpose is the public interest rather than any private interest but that it is not in the public interest that those who have money to invest in railroads should be discouraged and that the commission in the Nickel Plate had interpreted its powers as giving it the right to require fair treatment. He thought, however, that the commission should not be required to "travel outside the record" if no issue were presented to it.

When Representative Newton asked if the commission is not better qualified to act as appraisers than courts dependent upon appraisers to be appointed for each case, Mr. Hall said the commission had built up an experienced organization for its valuation work but that it was primarily engaged in ascertaining values for rate-making purposes of the property devoted to public service and that many other elements would have to be considered in determining the value of securities.

Representative Rayburn asked if consolidation would lead to economies in railroad operation. Commissioner Hall replied that there would be some direct economies in money but more in the way of better service and that he had seen statements as to the possibilities of economies that he thought greatly exaggerated. He said there is always expense involved in transferring from one railroad to another and that a considerable expense could be saved if the bulk of the traffic could be moved to destination with a one-line or two-line haul, but that the greatest economies in operation come from the investment of capital and that stronger systems can raise capital at less cost, which in turn tends to bring about lower operating expenses and to hasten the day when rates may be reduced.

He also said that the problem of regulation would be greatly simplified if the commission, instead of having to deal with all kinds of railroads, could deal with fewer systems that could all "take the same kind of medicine."

The reason the railways have "come back" so satisfactorily since 1920, Mr. Hall said, is that they have spent enormous amounts of new capital for increasing and improving their facilities.

Regarding the "weak line" problem, Mr. Hall said that it must be remembered that conditions are not permanent and that roads that were weak a few years ago are now strong and vice versa. He said, however, that he had not considered the bill primarily as "an orphan asylum for weak sisters," but that a rational plan of consolidation would take in non-productive properties on the basis of their present real value, which might be less than their valuation for rate purpose, and not on the basis of what they might be in years to come.

The Interest of the Short Lines

Amendment of the consolidation provisions of the transportation act is necessary to protect the short and weak railroads, Ben B. Cain, vice-president and general counsel of the American Short Line Railroad Association, testified before the committee on June 4. The provisions of the Parker bill are excellent as far as they go, Mr. Cain said, but more is necessary if some 30,000 miles of short and weak lines are to be preserved for the public service and an equitable distribution of the revenues of the transportation system derived from group rate-making by the Interstate Commerce Commission is to be insured. He favored substantially the provisions of the Cummins bill, which provides for a grouping of the railroads after five years into systems and for the distribution of all excess earnings above 6 per cent of roads not yet consolidated into systems, among the roads that have failed to earn 5 per cent as a three-year average. After one of the systems proposed by the commission should be completed there would be no recapture of its excess earnings, but the earnings would remain for distribution within the system.

There are some short lines that ought to be eliminated, Mr. Cain said, but most of them perform a service that is necessary to the communities they serve and their abandonment would not be permitted. Many are weak only because they are so situated that they cannot secure higher rates than other roads yet their costs of transportation are naturally higher because of their less dense traffic and because of the competitive situation they are often unable to obtain a large division of the through rate.

As far as passenger service is concerned, automobile transportation often offers a satisfactory substitute, Mr. Cain said, but it cannot serve the purpose where carload freight is involved. The roads which have survived the war, he said, may be considered to have demonstrated that they are needed by their communities, but many of them are not earning their operating expenses.

"The railroads of the country must be considered as a system," he said, "and if 30,000 miles of short and weak lines are not to be preserved the whole plan and purpose of the transportation act is a ghastly failure and the situation will be worse than it was before, because the strong lines have been given certain advantages which make it possible for them to stifle their weak competitors. The transportation act was intended to solve the problem and consolidation was the cap-stone of the structure but the strong roads have been permitted to take their pick and absorb only those which they wanted to take."

General News Department

Patrick E. Crowley, president of the New York Central, has received from St. Bonaventure College, Allegany, N. Y., the honorary degree of doctor of laws.

The Official Guide announces that henceforth it will publish, month by month, the schedules of the air mail routes operated by the United States Government. The June issue contains about one-half page of these time tables. Besides the New York-San Francisco and New York-Chicago lines, operated directly by the Post Office Department, there are nine others, all operated under contract. These are: Chicago and Dallas, Chicago and Minneapolis, Chicago and St. Louis, Salt Lake City and Los Angeles, Detroit and Cleveland, Detroit and Chicago, Jacksonville and Miami, Elko and Pasco, Cheyenne and Pueblo. From a number of distant points, the Guide receives by air mail new time tables which are issued only a short time before the magazine goes to press, and the present issue, including many new time tables which went into effect on June 6, came out (on the 4th) at least one day earlier than would have been possible before the air mail service was instituted.

Western Roads to Co-operate with Airplane Passenger Service

The Great Northern and the Northern Pacific have expressed their willingness to co-operate with airplane service between Detroit, Mich., and St. Paul, Minn., should air service be established by the Stout Air Services, Inc., and the Fokker Aircraft Corporation. The railroads will provide conveniences for a connection between their through trains and the airplanes so that eastbound passengers can be picked up at St. Paul and taken by plane to Chicago or Detroit and catch fast trains for New York, thereby saving a day's time. The airplane companies look to the railroads to co-operate by selling tickets and advertising. One company is making an effort to sell aircraft to the railroads.

Railroads Fail to Agree

A conference was held in New York during the past week attended by officers of the Southern Pacific, the Great Northern and the Northern Pacific, relative to the establishment of mutual trackage rights over or joint use of lines of the three carriers in Oregon and California to obviate the necessity of construction of additional mileage. No definite agreement was announced but it was understood that the matter will be discussed further, at a later conference. Those attending the conference included Ralph Budd, president of the Great Northern; Charles Donnelly, president of the Northern Pacific, and the following officers of the Southern Pacific: Henry W. DeForest, chairman; William Sproule, president; Paul Shoup, executive vice-president, and A. D. McDonald, vice-chairman of the executive committee.

Bill Proposes to Exempt Short Lines from Recapture of Excess Income

Senator Pittman of Nevada on June 3 introduced in the Senate a bill, S. 4390, to exempt from the recapture provisions of section 15a of the transportation act, retroactively to February 28, 1920, railroads whose first main track does not exceed 200 miles in length, those whose operating revenues have not exceeded $10,000 per mile as an average for the three preceding years, and those deemed to have a "probable limited service life," provided the roads so exempted are not part of a general system of transportation operating more than 200 miles. The Interstate Commerce Commission would be authorized to determine which railroads have a limited service life because of the exhaustion of their sources of traffic and to permit them to set aside a percentage of their earnings each year as a "depletion account."

Wage-Rate Conference at New York

The request of the Order of Railway Conductors and the Brotherhood of Railway Trainmen for a general increase of 20 per cent in the rates of the pay of these classes, was considered at a conference in New York City last week between the leaders of the two brotherhoods and a committee of railroad officers headed by J. G. Walber, vice-president of the New York Central, representing most of the eastern lines; but the conference was soon terminated with the declination of the request by the railroads. This end of the discussion evidently was the result of a tacit agreement to take the question up again after President Coolidge shall have appointed members of the federal board of mediation, which is provided for by the new law.

A request for an increase in wages for enginemen, approximating the percentage asked for by the brakemen and conductors at New York, was ratified by a sub-committee of general chairmen of the Brotherhood of Locomotive Engineers at Cleveland, Ohio, on June 4. The sub-committee of general chairmen, which fixed the proposed scales, is expected to meet with a sub-committee of the Brotherhood of Locomotive Firemen and agree upon a unified demand for enginemen and firemen.

Santa Fe Objects to Examiners' Report on Texas Construction

Attorneys for the Atchison, Topeka & Santa Fe and the Pecos & Northern Texas have filed with the Interstate Commerce Commission a brief statement of exceptions to the proposed report by the commission's examiners recommending the granting of a certificate authorizing the Texas Panhandle & Gulf to build its proposed line from Seymour, Tex., to Tucumcari, N. M., in preference to that asked by the Pecos & Northern Texas for the construction of its proposed branch lines serving the same section of country. The examiners' report recommended a condition that such control of the Panhandle company be acquired by a major carrier other than the Santa Fe or Burlington "as to assure the proper financing and operation of the applicant's proposed line."

The Santa Fe companies contend that the South Plains area is reasonably served by existing Santa Fe lines and with the completion of the proposed Santa Fe branches practically all the territory will be within 15 miles of a railroad; that the history of the existing lines on the South Plains shows that there is not enough traffic and development to support two railroads; that the duplication of railroads on the South Plains is not justified while the existing Santa Fe lines are employed only to a fraction of their capacity; that no justification is found in the transportation act for the introduction of competition which would deprive an existing carrier of a fair return on its investment, and that the proposed Santa Fe branch extending from Plainview to Dimmitt is entitled to more favorable consideration than it received from the examiners.

Four separate companies, three controlled by existing large systems, had applied to the commission for authority to build lines in the South Plains country, but the proposed report favored the independent project.

The project of the Texas Panhandle & Gulf, the Santa Fe attorneys state, was so ill conceived and carries so little promise of success that the examiners felt a duty to revise and alter it. The efforts of the examiners "have resulted in a plan which we think even the sponsors of the Texas Panhandle & Gulf will disown. The construction of the Texas Panhandle & Gulf in accordance with the conditions proposed by the examiners would prejudice the interests of the Santa Fe lines upon the South Plains. Like the Denver and the Quanah in a less degree, it would divert traffic developed by the long-continued efforts of the Santa Fe which the Santa Fe can ill afford to lose. The intervenors, the Pecos & Northern Texas Railway and the Atchison, Topeka & Santa Fe Railway, invoke the protection of this commission. The public

(*Continued on page* 1694)

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF APRIL AND FOUR MONTHS OF CALENDAR YEAR 1926

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after rents, 1925.
Akron, Canton & Youngstown	April	171	$255,606	$432	$269,255	$53,124	$30,392	$12,758	$77,004	$17,577	$190,855	70.9	$78,400	$59,233	$28,497	$53,603
	4 mos.	171	989,744	1,606	1,040,639	194,591	115,650	47,297	311,119	62,106	729,867	70.1	310,772	235,676	108,208	167,080
Alabama & Vicksburg	April	141	202,440	46,999	272,192	45,426	52,831	9,574	93,324	15,293	218,304	80.2	53,888	26,253	27,394	49,269
	4 mos.	141	837,503	200,273	1,116,684	179,744	206,859	40,411	387,694	62,743	883,804	79.2	232,880	119,945	124,178	213,325
Vicksburg, Shreveport & Pacific	April	188	234,909	50,688	308,444	60,004	69,468	11,993	124,234	17,833	285,806	92.7	22,638	—86	—10,206	31,651
	4 mos.	188	1,079,030	208,534	1,381,473	236,426	277,944	51,685	525,709	71,920	1,172,517	84.9	208,956	111,781	54,489	114,779
Ann Arbor	April	293	445,816	28,326	488,811	46,937	102,647	12,824	204,085	14,527	381,020	77.9	107,791	84,588	69,628	88,206
	4 mos.	293	1,743,310	105,181	1,902,779	141,059	402,495	45,800	826,858	55,627	1,471,884	77.4	430,895	338,038	278,793	279,637
Atchison, Topeka & Santa Fe	April	9,219	10,673,120	2,938,946	14,873,020	2,933,455	3,125,991	362,249	4,807,937	364,215	11,559,021	77.7	3,313,999	2,174,941	2,232,339	1,500,790
	4 mos.	9,219	41,339,449	12,623,173	58,836,772	8,730,493	12,378,048	1,425,110	19,304,641	1,447,709	43,116,223	73.3	15,720,549	10,755,733	10,944,989	8,940,842
Gulf, Colorado & Santa Fe	April	1,908	1,581,059	215,092	1,924,273	561,492	438,337	50,023	725,637	67,390	1,840,941	95.7	83,332	—9,409	—119,452	—187,652
	4 mos.	1,908	6,895,002	893,621	8,306,692	1,949,121	1,825,445	203,066	2,975,230	254,992	7,195,526	86.6	1,111,166	738,525	295,514	820,742
Panhandle & Santa Fe	April	923	760,938	128,166	954,296	99,649	203,572	9,423	281,247	19,545	612,706	64.2	341,590	295,051	238,927	—62,995
	4 mos.	923	3,063,745	483,270	3,785,732	335,133	740,944	38,484	1,052,851	78,495	2,242,151	59.2	1,543,581	1,322,230	1,120,247	490,721
Atlanta & West Point	April	93	170,384	66,797	268,424	34,987	48,015	11,436	94,527	11,863	206,057	76.8	62,367	47,684	38,484	29,883
	4 mos.	93	654,664	275,792	1,057,830	156,554	181,070	43,717	382,479	46,081	829,582	78.4	228,248	169,154	117,883	114,245
Western of Alabama	April	133	223,693	61,089	308,987	36,226	51,631	12,123	91,428	13,587	209,684	67.9	99,303	76,834	73,746	42,659
	4 mos.	133	830,856	259,413	1,189,587	133,192	218,897	46,294	364,794	47,845	829,520	69.7	360,067	292,322	264,436	225,670
Atlanta, Birmingham & Atlantic	April	639	383,845	36,885	475,631	106,417	98,222	25,906	177,447	18,193	437,523	91.99	38,108	24,222	4,837	2,344
	4 mos.	639	1,623,397	161,816	1,983,931	406,361	376,187	106,755	724,302	75,070	1,733,961	87.40	249,970	194,199	97,844	15,210
Atlantic Coast Line	April	4,924	6,303,574	2,024,712	9,060,340	1,059,223	1,596,040	154,237	3,163,596	170,098	6,222,362	68.7	2,837,978	2,236,531	1,772,774	2,172,845
	4 mos.	4,924	25,164,021	9,693,225	37,846,508	3,847,512	6,098,509	625,634	12,710,223	681,917	24,307,288	64.2	13,539,220	11,235,104	9,579,310	9,415,825
Charleston & Western Carolina	April	342	310,536	21,355	347,808	69,284	44,365	6,700	128,024	6,713	255,086	73.3	92,722	71,212	52,437	81,404
	4 mos.	342	1,299,128	87,757	1,442,414	269,756	179,508	28,799	550,333	26,384	1,054,780	73.1	387,634	301,649	249,788	336,952
Baltimore & Ohio	April	5,294	15,801,795	2,205,782	19,300,144	2,300,406	4,652,103	403,986	6,709,984	571,773	14,812,400	76.8	4,487,744	3,603,350	3,304,236	2,654,468
	4 mos.	5,294	62,932,493	8,417,414	76,089,425	9,201,542	18,091,503	1,577,913	28,356,753	2,114,628	59,994,979	78.9	16,094,446	12,538,912	11,481,151	9,194,942
Baltimore & Ohio Chicago Term.	April	80	.....	.....	297,479	35,600	29,403	1,862	160,187	13,508	246,340	82.8	51,139	1,040	87,177	106,724
	4 mos.	80	.....	.....	1,153,784	130,037	125,271	7,634	654,852	38,476	980,839	85.0	172,945	—12,044	377,386	305,569
Staten Island Rapid Transit	April	23	119,807	111,547	264,513	51,373	33,475	2,284	104,891	15,908	207,931	78.6	56,582	39,676	1,936	—8,466
	4 mos.	23	432,239	418,305	949,205	168,438	123,996	7,988	426,827	58,898	786,147	82.8	163,058	98,148	—43,803	—116,813
Bangor & Aroostook	April	615	509,588	83,480	621,326	71,578	137,193	6,058	157,871	23,459	399,437	64.3	221,889	172,482	173,112	248,547
	4 mos.	615	2,297,696	310,335	2,703,203	414,557	516,977	19,935	713,636	97,770	1,773,738	65.6	929,465	719,795	788,367	868,274
Belt Ry. Co. of Chicago	April	32	.....	.....	595,953	57,062	67,596	2,988	274,918	9,714	412,278	69.2	183,675	130,251	164,407	123,385
	4 mos.	32	.....	.....	2,350,730	169,860	245,602	12,863	1,185,172	38,405	1,651,902	70.3	698,828	502,286	650,796	508,088
Bessemer & Lake Erie	April	228	877,745	14,139	914,322	99,431	318,519	14,776	282,737	33,544	755,190	82.6	159,132	129,187	169,756	78,011
	4 mos.	228	2,812,783	63,153	2,959,507	271,643	1,264,850	59,207	1,077,137	134,943	2,830,903	95.7	128,604	8,822	270,179	660,339
Bingham & Garfield	April	33	46,278	.....	41,258	8,697	7,743	1,607	12,359	5,172	35,756	86.7	5,502	—4,313	12,774	18,911
	4 mos.	33	174,184	.....	180,495	31,538	39,709	6,077	45,153	19,408	142,515	79.0	37,980	—3,575	60,041	64,639
Boston & Maine	April	2,276	4,267,326	1,580,548	6,667,599	713,725	1,241,018	67,854	2,699,526	234,342	4,979,466	74.7	1,688,133	1,440,189	1,177,102	847,954
	4 mos.	2,276	16,449,357	6,640,433	26,172,051	2,834,739	4,984,918	257,168	10,989,705	965,829	20,129,509	76.9	6,042,543	5,015,994	3,900,266	2,720,927
Brooklyn Eastern District Term.	April	9	118,297	.....	125,865	8,779	19,626	1,521	44,340	7,177	81,443	64.7	44,422	37,985	40,185	35,494
	4 mos.	9	458,820	.....	489,190	31,762	55,907	2,241	180,699	24,909	295,518	60.4	193,672	165,770	172,450	162,291
Buffalo & Susquehanna R. R. Corp.	April	253	93,478	3,304	100,863	27,109	41,316	1,829	33,535	7,927	111,716	110.8	—10,853	—14,003	—3,631	11,307
	4 mos.	253	374,266	12,214	401,080	106,193	155,767	7,287	136,788	32,229	438,264	109.3	—37,184	—49,784	611	130,002
Buffalo, Rochester & Pittsburgh	April	601	1,208,419	104,483	1,366,086	131,645	400,930	29,465	502,598	42,346	1,109,454	81.2	256,632	206,627	213,077	119,606
	4 mos.	601	5,028,904	420,665	5,648,491	506,075	1,675,585	114,487	2,091,278	164,205	4,560,681	80.7	1,087,810	887,805	1,040,117	627,023
Canadian Pacific, Lines in Maine	April	233	255,871	30,915	269,865	46,474	54,273	4,724	99,746	3,232	208,449	77.2	61,416	50,916	38,390	—39,067
	4 mos.	233	989,364	131,560	1,171,230	119,533	234,729	19,633	488,146	13,386	875,427	74.7	295,803	253,803	197,002	137,207
Central of Georgia	April	1,917	1,825,567	490,259	2,572,594	405,563	459,136	79 749	996,335	98,353	2,039,588	79.3	533,006	426,572	370,248	411,204
	4 mos.	1,917	7,397,237	2,201,539	10,581,521	1,574,218	1,798,523	296,956	3,991,691	391,675	8,072,624	76.3	2,508,897	2,030,397	1,734,482	1,581,970
Central of New Jersey	April	690	4,102,235	667,291	5,117,127	474,615	1,020,261	42,741	1,787,792	114,562	3,459,935	67.6	1,657,192	1,214,435	1,102,027	735,328
	4 mos.	690	13,340,820	2,677,455	17,238,659	1,605,038	3,979,647	156,353	7,149,141	505,638	13,477,629	78.2	3,761,030	2,264,908	1,778,085	2,353,351
Central Vermont	April	433	559,000	105,146	755,670	105,768	112,607	14,816	321,916	23,703	580,572	76.8	175,098	155,970	136,781	—55,633
	4 mos.	433	2,005,863	438,346	2,721,002	318,059	463,152	57,501	1,305,858	93,562	2,244,404	82.5	476,598	390,803	339,098	—24,177
Chesapeake & Ohio	April	2,650	8,422,808	729,751	9,672,430	1,553,861	2,644,554	117,927	2,671,615	246,950	7,266,473	75.1	2,405,957	1,846,671	2,103,356	1,863,907
	4 mos.	2,638	35,354,439	2,855,166	39,898,643	5,749,629	10,583,623	459,203	11,692,011	961,171	29,570,940	74.1	10,337,696	8,090,552	8,936,510	7,295,320
Chicago & Alton	April	1,055	1,707,084	494,944	2,427,585	384,880	593,544	65,395	905,671	60,902	1,998,069	82.3	429,516	321,264	170,708	213,837
	4 mos.	1,055	6,760,761	2,004,839	9,623,941	1,095,848	2,441,584	272,763	3,730,394	282,486	7,754,271	80.6	1,869,670	1,437,381	769,355	1,033,606
Chicago & Eastern Illinois	April	945	1,522,102	345,750	2,044,236	220,828	644,801	78,844	837,364	67,386	1,876,121	91.8	168,115	47,389	—87,360	—26,809
	4 mos.	945	6,795,444	1,447,351	8,925,823	782,536	2,715,758	309,986	3,511,908	277,754	7,662,356	85.8	1,263,467	820,945	339,826	234,128
Chicago & North Western	April	8,457	8,181,439	2,028,278	11,596,596	1,998,906	2,518,344	190,612	4,646,139	336,961	9,767,230	84.2	1,829,366	1,027,424	997,027	654,737
	4 mos.	8,459	31,841,974	8,327,246	45,363,958	5,808,753	10,311,541	687,780	18,666,477	1,351,535	37,120,604	81.8	8,243,354	5,029,142	4,620,907	2,648,679
Chicago, Burlington & Quincy	April	9,404	9,036,363	1,688,273	12,442,478	1,870,454	2,513,625	241,559	4,275,360	326,362	9,275,542	74.5	3,166,936	2,376,860	2,150,993	1,242,318
	4 mos.	9,404	37,400,385	7,277,708	49,833,291	5,181,710	10,889,064	910,215	17,729,852	1,409,598	36,468,388	73.2	13,364,903	9,626,850	8,785,694	6,273,911
Chicago Great Western	April	1,496	1,492,877	238,963	1,890,225	330,734	386,172	68,778	767,304	59,237	1,624,336	85.9	265,899	186,864	65,567	—53,688
	4 mos.	1,496	5,877,072	1,069,850	7 538,787	863,847	1,573,581	281,024	3,183,661	232,198	6,182,892	82.0	1,355,865	1,017,386	524,131	350,807
Chicago, Indianapolis & Louisville	April	647	1,101,009	230,005	1,472,220	143,775	360,376	36,051	530,463	36,287	1,119,916	76.1	352,304	274,190	175,373	188,347
	4 mos.	647	4,489,553	810,841	5,853,822	509,458	1,328,488	140,926	2,186,472	141,549	4,358,040	74.4	1,495,782	1,184,725	775,918	712,642

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF APRIL AND FOUR MONTHS OF CALENDAR YEAR 1926—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after rents, 1925.
Chicago, Milwaukee & St. Paul	April	11,193	$9,451,487	$1,485,784	$12,234,347	$2,141,766	$3,208,499	$225,431	$4,733,040	$346,802	$10,709,727	87.5	$1,524,620	$774,234	$448,169	$54,904
	4 mos.	11,202	37,779,491	6,117,387	48,892,446	6,049,217	12,912,244	912,069	19,447,430	1,360,236	40,881,594	83.6	8,010,852	4,998,361	3,675,190	3,266,702
Chicago, Peoria & St. Louis	April	215	44,860	8,290	59,628	16,249	10,585	623	37,187	7,017	71,661	120.2	—12,033	—15,271	—25,716	—22,821
	4 mos.	215	218,209	36,319	278,748	51,547	52,273	3,488	148,081	29,140	284,529	102.1	—5,781	—15,020	—71,808	—83,735
Chicago River & Indiana	April	19	.....	.....	549,545	65,465	81,664	880	214,792	20,139	382,940	69.7	166,605	126,789	239,757	216,536
	4 mos.	19	.....	.....	2,223,020	218,845	306,906	3,442	890,814	72,659	1,492,666	67.1	730,354	564,471	1,014,758	965,403
Chicago, Rock Island & Pacific	April	7,563	6,959,737	1,758,893	9,617,848	1,300,556	2,424,462	228,072	3,853,952	321,736	8,187,572	85.1	1,430,276	837,184	452,580	655,767
	4 mos.	7,563	28,353,192	7,232,049	39,020,114	4,971,997	9,339,375	927,913	15,677,571	1,212,591	32,348,078	82.9	6,672,036	4,303,618	2,848,908	3,617,528
Chicago, Rock Island & Gulf	April	458	342,876	66,565	452,167	80,750	91,789	18,886	199,631	16,075	409,882	90.6	42,285	24,207	—573	9,172
	4 mos.	458	1,461,304	298,871	1,921,951	279,215	307,086	75,640	831,742	64,813	1,567,004	81.5	354,947	282,496	201,359	321,261
Chic., St. Paul, Minn. & Omaha	April	1,841	1,503,235	377,657	2,038,776	289,720	372,199	34,081	908,920	78,885	1,696,086	83.2	342,690	237,696	173,267	35,626
	4 mos.	1,841	6,114,737	1,619,896	8,351,569	1,032,062	1,638,650	140,249	3,805,841	305,497	6,968,334	83.4	1,383,235	923,531	709,157	889,238
Cincinnati, Indianapolis & Western	April	347	331,008	23,201	378,038	54,400	80,671	15,171	157,703	33,471	342,307	90.5	35,731	18,660	—16,220	—2,836
	4 mos.	347	1,349,921	95,170	1,540,793	156,994	340,730	63,613	643,366	84,307	1,292,128	83.9	248,665	177,220	43,163	56,159
Clinchfield Railroad	April	309	609,572	24,907	648,515	66,891	182,750	22,973	128,129	19,790	413,868	63.8	234,647	174,544	234,392	239,143
	4 mos.	309	2,560,421	105,927	2,723,681	241,962	778,720	91,326	556,294	77,559	1,743,003	64.0	980,678	740,579	1,154,782	1,143,027
Colorado & Southern	April	1,056	794,136	102,215	980,299	112,327	225,889	13,210	351,384	42,918	751,319	76.6	228,980	164,730	156,854	3,356
	4 mos.	1,056	3,112,594	423,001	3,875,529	437,946	934,072	53,019	1,486,631	170,968	3,105,824	80.1	769,705	514,131	438,448	313,422
Ft. Worth & Denver City	April	491	636,991	174,590	875,462	84,953	175,792	15,745	283,481	36,770	604,493	69.0	270,969	209,880	204,365	135,504
	4 mos.	491	2,762,704	676,377	3,680,484	305,758	698,546	60,462	1,217,872	153,083	2,463,807	66.9	1,216,677	975,563	961,173	978,270
Wichita Valley	April	271	77,302	17,971	103,050	15,628	6,936	7	35,337	1,836	58,923	57.2	44,127	34,225	16,868	19,507
	4 mos.	271	405,094	72,099	508,136	68,766	34,457	46	171,897	7,317	276,357	54.4	231,779	193,276	113,291	103,829
Columbus & Greenville	April	167	110,832	21,006	139,906	42,042	17,024	3,341	51,504	10,013	123,624	88.4	16,282	14,778	111	—12,937
	4 mos.	167	483,522	97,263	619,685	171,219	70,687	13,126	230,617	42,344	527,280	85.1	92,405	86,638	18,468	—35,765
Delaware & Hudson	April	881	3,493,154	256,988	3,974,046	398,019	917,691	49,426	1,296,160	143,437	2,822,696	71.0	1,151,350	1,063,350	1,040,846	608,299
	4 mos.	881	10,982,088	1,087,013	12,831,351	1,653,328	3,440,173	194,154	4,964,791	567,357	10,872,170	84.7	1,959,181	1,606,108	1,331,048	1,995,542
Delaware, Lackawanna & Western	April	992	5,635,929	998,074	7,484,274	665,570	1,458,420	120,777	2,720,476	180,383	5,200,599	69.5	2,283,675	1,622,402	1,722,989	1,551,875
	4 mos.	992	18,468,441	4,026,474	25,739,903	2,204,470	5,265,324	485,399	10,760,507	701,407	19,622,005	76.2	6,117,898	3,914,214	4,048,374	4,548,518
Denver & Rio Grande Western	April	2,556	1,888,046	314,376	2,397,497	490,289	479,872	54,521	735,802	87,344	1,872,512	78.1	524,985	339,709	410,785	427,642
	4 mos.	2,550	7,879,243	1,235,009	9,810,327	1,715,708	1,928,260	213,198	3,058,567	345,707	7,374,294	75.2	2,436,033	1,695,313	1,866,111	1,420,573
Denver & Salt Lake	April	255	267,068	25,714	312,899	108,343	99,587	1,938	77,660	6,909	292,907	93.6	19,992	13,992	14,934	—35,307
	4 mos.	255	994,388	97,402	1,178,539	305,258	397,206	6,259	311,939	27,279	1,046,411	88.8	132,128	108,122	117,894	46,100
Detroit & Mackinac	April	375	89,592	26,670	129,060	18,230	40,072	1,868	52,960	5,928	119,052	92.2	10,008	—201	5,452	9,541
	4 mos.	375	329,490	95,885	472,892	74,025	158,526	7,415	200,948	21,619	462,494	97.8	10,398	—30,309	122	53,365
Detroit & Toledo Shore Line	April	50	392,523	.....	396,693	54,692	31,146	3,207	93,527	9,233	191,805	48.4	204,888	181,415	94,697	—15,703
	4 mos.	50	1,717,545	.....	1,733,464	156,296	144,548	13,112	456,262	35,272	805,490	46.5	927,974	833,912	440,469	187,230
Detroit Terminal	April	26	.....	.....	223,188	39,734	17,061	.....	110,541	3,666	171,002	76.6	52,186	35,654	37,472	94,121
	4 mos.	26	.....	.....	832,323	146,634	70,222	6	466,509	14,468	697,839	83.8	134,484	79,290	79,210	211,965
Detroit, Toledo & Ironton	April	486	1,096,517	12,015	1,121,229	154,447	205,851	13,069	322,488	46,237	741,595	66.1	379,634	327,460	225,799	291,647
	4 mos.	488	4,388,390	43,323	4,479,888	575,121	829,810	44,273	1,272,739	133,443	2,846,384	63.5	1,633,504	1,349,129	942,504	1,126,605
Duluth & Iron Range	April	275	60,513	4,286	77,413	82,841	107,628	1,603	90,510	18,178	301,039	388.9	—223,626	—236,778	—230,611	36,140
	4 mos.	275	325,029	27,742	399,234	254,026	431,790	5,224	404,363	75,422	1,171,961	293.6	—772,727	—756,116	—750,554	—514,332
Duluth, Missabe & Northern	April	306	103,598	6,392	123,880	199,589	209,825	2,970	140,215	22,852	576,692	465.0	—452,212	—539,223	—549,226	247,826
	4 mos.	306	394,525	27,607	473,851	552,085	794,516	12,068	563,672	89,092	2,013,444	424.9	—1,539,593	—1,740,350	—1,772,749	—992,476
Duluth, Winnipeg & Pacific	April	178	153,013	12,828	170,849	27,245	38,972	4,110	61,570	8,135	140,097	82.0	30,752	22,210	47,840	23,682
	4 mos.	178	693,838	53,808	770,863	84,868	205,610	16,325	274,565	42,143	622,813	80.8	148,050	109,923	136,955	199,825
Elgin, Joliet & Eastern	April	459	2,014,611	10	2,207,633	212,782	462,580	13,038	725,883	45,848	1,460,013	66.1	747,620	652,821	467,142	355,735
	4 mos.	459	7,840,399	24	8,598,658	674,757	1,834,161	54,524	2,935,949	177,626	5,678,658	66.0	2,920,000	2,540,756	1,847,758	1,662,992
Erie R. R.	April	2,053	7,173,565	953,608	8,842,319	1,059,098	2,460,505	148,094	3,476,700	313,522	7,502,231	84.8	1,340,088	975,696	1,113,454	1,374,059
	4 mos.	2,053	26,038,247	3,755,604	32,665,148	3,895,450	8,912,879	597,161	13,984,635	1,186,685	28,751,130	88.0	3,914,018	2,449,727	2,721,622	3,099,832
Chicago & Erie	April	269	1,118,218	49,932	1,262,803	129,871	159,460	23,102	392,666	43,395	748,786	59.3	514,017	450,131	101,642	137,236
	4 mos.	269	4,188,480	200,665	4,750,249	453,672	556,532	96,683	1,578,588	165,878	2,852,001	60.0	1,898,248	1,642,675	333,831	475,797
New Jersey & New York	April	45	32,667	94,538	133,876	15,501	22,744	1,372	70,344	4,326	114,285	85.4	19,591	15,949	—16,065	—25,833
	4 mos.	45	115,688	374,192	512,480	63,354	93,235	5,635	289,100	17,601	468,923	91.5	43,557	27,851	—95,612	—103,676
N. Y., Susquehanna & Western	April	135	365,652	49,996	467,688	48,106	65,759	4,593	196,491	13,352	328,296	70.2	139,392	110,158	88,825	82,954
	4 mos.	135	1,169,553	203,561	1,569,914	207,136	225,852	17,072	804,309	49,019	1,303,312	83.0	266,602	149,618	104,968	110,245
Evansville, Indianap. & Terre Haute	April	146	197,297	5,308	209,735	27,342	36,192	2,097	67,878	6,770	140,279	66.9	69,456	63,873	30,594	26,983
	4 mos.	146	819,056	25,093	869,991	89,723	135,950	8,306	295,828	25,674	554,847	63.8	315,144	292,799	163,002	166,537
Florida East Coast	April	849	1,735,256	780,132	2,847,969	466,111	452,778	27,441	1,084,327	50,600	2,044,921	71.8	803,048	662,327	409,753	403,389
	4 mos.	849	7,259,284	4,463,940	13,204,465	1,830,484	1,748,982	143,286	4,838,936	208,994	8,777,592	66.5	4,426,873	3,907,882	2,780,081	2,396,670
Fort Smith & Western	April	249	110,931	12,583	130,705	27,157	26,918	5,770	47,478	7,447	114,449	87.6	16,256	10,752	—4,408	21,312
	4 mos.	249	458,660	57,046	547,595	106,271	115,614	22,305	193,045	30,307	466,571	85.2	81,024	59,003	—1,390	77,427
Galveston Wharf Co	April	13	.....	.....	91,370	45,576	5,894	1,253	26,591	3,475	86,110	94.2	5,260	—11,765	—11,771	13,429
	4 mos.	13	.....	.....	410,842	158,220	20,301	5,382	115,836	12,595	324,864	79.1	85,978	17,953	17,615	154,785
Georgia R. R.	April	328	403,912	83,775	522,853	48,639	103,471	22,838	205,990	23,402	404,349	77.3	118,504	104,976	98,109	99,101
	4 mos.	328	1,585,543	332,575	2,052,921	208,244	406,220	89,551	846,649	88,588	1,639,407	79.9	413,514	367,011	361,268	274,544
Georgia & Florida	April	406	109,257	20,285	139,925	16,929	14,961	7,861	55,091	7,658	102,726	73.4	37,199	30,192	11,336	5,097
	4 mos.	406	521,010	90,709	659,339	85,292	72,652	33,721	248,838	32,105	473,500	71.8	185,839	157,775	77,608	22,076

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF APRIL AND FOUR MONTHS OF CALENDAR YEAR 1926—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures.	Maintenance of—Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after rents, 1925.
Grand Trunk Western	April	347	$1,412,717	$153,560	$1,639,108	$152,891	$327,263	$36,086	$601,190	$60,597	$1,186,194	72.4	$452,914	$375,159	$287,213	$110,866
	4 mos.	347	5,326,704	612,871	6,255,721	448,876	1,477,586	142,835	2,310,887	229,167	4,643,698	74.2	1,612,023	1,229,038	935,969	48,166
Atlantic & St. Lawrence	April	166	149,494	31,797	198,804	21,601	70,013	5,129	96,366	7,312	161,963	81.4	36,841	23,155	—41,728	—25,985
	4 mos.	166	707,084	123,813	889,604	101,383	136,020	20,229	481,044	32,024	776,125	87.2	113,479	58,843	—208,339	—269,521
Chic., Det. & Canada Gr. Tr. Jct.	April	59	238,053	3,062	295,444	26,652	26,805	3,969	95,392	4,020	156,703	53.0	138,741	128,008	95,287	72,629
	4 mos.	59	1,085,127	13,624	1,285,544	111,316	78,316	15,951	414,027	16,901	635,567	49.4	649,977	609,802	475,352	432,584
Det., Grand Haven & Milwaukee	April	189	507,445	35,971	598,776	44,850	85,206	11,299	241,059	15,803	398,552	66.6	200,224	195,904	106,364	84,000
	4 mos.	189	1,909,596	129,342	2,232,685	176,180	211,863	45,087	993,871	60,663	1,485,856	66.6	746,829	724,758	370,192	153,433
Great Northern	April	8,221	5,905,113	880,313	7,485,546	1,431,709	1,542,042	237,903	2,708,711	211,973	6,157,150	82.3	1,328,396	591,166	699,159	698,322
	4 mos.	8,221	22,217,462	3,856,505	28,874,487	3,647,939	5,989,879	836,850	11,250,476	871,317	22,824,230	79.0	6,050,257	3,105,440	3,328,300	3,114,367
Green Bay & Western	April	234	122,225	9,002	136,281	27,890	24,392	5,078	46,650	4,548	108,558	79.6	27,723	17,723	18,321	13,596
	4 mos.	234	501,167	37,002	558,024	82,855	89,111	18,920	198,391	12,055	401,246	71.9	156,778	119,638	115,984	67,733
Gulf & Ship Island	April	307	237,126	43,018	311,253	214,871	69,644	4,837	138,957	7,693	439,277	141.1	—128,024	—155,281	—167,239	45,762
	4 mos.	307	1,054,923	193,268	1,363,900	617,441	268,638	20,400	565,154	29,856	1,514,497	111.0	—150,597	—255,423	—338,542	223,024
Gulf, Mobile & Northern	April	466	454,062	28,345	503,691	77,259	76,278	23,268	145,305	21,159	343,485	68.19	160,206	114,075	110,970	119,957
	4 mos.	466	1,834,189	126,760	2,048,445	325,047	323,077	94,408	574,268	88,951	1,406,256	68.65	642,189	471,286	453,407	408,531
Hocking Valley	April	348	1,262,200	58,542	1,432,357	191,709	416,877	15,891	438,552	40,317	1,103,320	77.0	329,037	217,201	80,071	261,252
	4 mos.	348	5,103,254	252,261	5,693,004	669,049	1,616,162	60,285	1,816,675	165,227	4,326,805	76.0	1,366,199	919,196	967,929	862,796
Illinois Central	April	4,874	9,230,188	1,868,430	12,495,598	1,806,857	2,996,757	228,629	4,484,667	349,551	9,921,427	79.4	2,574,171	1,774,024	1,778,684	1,606,369
	4 mos.	4,874	38,793,184	8,342,286	51,205,091	6,572,959	11,702,587	1,018,156	18,387,986	1,350,847	39,253,645	76.7	11,951,446	8,429,419	8,580,540	7,857,899
Yazoo & Mississippi Valley	April	1,379	1,398,465	246,552	1,765,764	312,095	351,919	37,132	711,463	56,641	1,454,510	82.4	311,254	189,301	116,675	218,739
	4 mos.	1,379	6,149,142	1,091,652	7,695,005	1,304,516	1,447,714	136,085	2,935,060	214,888	6,017,950	78.2	1,677,055	1,124,644	872,021	1,415,544
Illinois Central Combined Report	April	6,254	10,628,653	2,114,982	14,261,362	2,118,952	3,348,676	265,761	5,196,130	406,192	11,375,937	79.8	2,885,425	1,963,325	1,895,359	1,825,108
	4 mos.	6,254	44,942,326	9,433,938	58,900,096	7,877,475	13,150,301	1,154,241	21,323,046	1,565,735	45,271,595	76.9	13,628,501	9,554,063	9,452,561	9,273,443
Kansas City, Mexico & Orient	April	272	133,778	7,241	149,265	41,011	36,111	7,274	68,081	6,953	159,430	106.8	—10,165	—14,165	5,627	13,385
	4 mos.	272	477,505	25,108	539,076	139,719	159,289	26,562	234,707	28,155	587,667	109.0	—48,591	—64,616	10,323	—48,462
Kan. City, Mex. & Orient of Tex.	April	465	257,898	15,065	285,275	75,272	51,637	7,823	93,185	7,124	234,845	82.3	50,430	43,430	4,847	35,416
	4 mos.	465	958,612	59,500	1,065,330	218,127	245,369	29,746	333,975	28,142	854,993	80.3	210,337	182,337	32,403	200,656
Kansas City Southern	April	784	1,316,648	111,542	1,582,274	162,057	270,520	51,289	499,328	76,795	1,051,565	66.5	530,709	422,698	377,640	240,948
	4 mos.	784	5,112,788	460,381	6,147,281	638,794	1,007,274	198,966	1,967,246	309,399	4,113,447	66.9	2,033,834	1,601,863	1,440,966	1,066,663
Texarkana & Ft. Smith	April	81	237,502	9,914	264,419	27,220	22,563	6,541	66,608	11,264	134,951	51.0	129,468	112,333	89,470	42,080
	4 mos.	81	865,196	41,467	973,967	82,303	80,822	24,212	270,025	40,171	500,409	51.4	473,558	404,486	286,455	226,064
Kansas Oklahoma & Gulf	April	Granted 30 day extension														
	4 mos.	Granted 30 day extension														
Lake Superior & Ishpeming	April	160	56,001	5,305	64,878	25,766	22,581	475	34,889	4,895	88,606	136.6	—23,728	—36,637	—40,293	—4,360
	4 mos.	160	250,990	21,522	287,346	119,256	103,172	2,067	145,631	19,829	380,948	132.6	—93,602	—144,535	—162,401	—115,102
Lake Terminal	April	13	.....	.....	81,350	14,390	15,673	.....	50,586	1,703	82,352	101.2	—1,002	—7,267	—5,931	—11,178
	4 mos.	13	.....	.....	320,899	43,169	71,158	.....	206,289	7,006	327,622	102.1	—6,723	—30,884	—22,185	—14,049
Lehigh & Hudson River	April	96	262,295	1,910	275,767	22,772	40,570	1,231	101,724	9,361	176,258	63.9	99,509	82,909	56,806	45,969
	4 mos.	96	887,397	9,471	1,009,789	88,342	124,231	7,777	407,286	57,632	685,268	67.9	324,521	265,121	165,514	126,755
Lehigh & New England	April	219	481,250	1,339	489,183	50,523	105,942	5,924	138,399	15,785	316,306	64.7	1,728,877	145,659	153,183	161,596
	4 mos.	219	1,325,726	5,749	1,358,351	142,901	353,747	20,032	491,014	67,532	1,074,797	79.1	283,554	228,838	274,496	350,223
Lehigh Valley	April	1,363	5,747,830	635,848	6,861,946	588,787	1,315,317	128,607	2,582,199	141,371	4,787,120	69.8	2,074,826	1,659,610	1,500,649	1,304,983
	4 mos.	1,363	18,804,950	2,337,306	22,831,313	2,553,581	5,113,418	491,023	10,011,443	548,434	18,836,551	82.5	3,994,762	2,897,830	2,288,895	3,716,471
Louisiana & Arkansas	April	302	335,785	17,695	362,312	49,163	58,285	10,913	100,600	12,610	231,355	63.9	130,957	96,367	80,566	64,771
	4 mos.	302	1,292,116	76,277	1,402,005	198,872	231,363	45,771	398,213	47,100	920,105	65.6	481,900	341,461	277,559	204,842
Louisiana Ry. & Nav. Co.	April	337	226,279	16,711	260,216	65,625	56,066	12,908	126,480	10,253	264,954	101.8	—4,738	—26,829	—59,084	—440
	4 mos.	337	966,741	68,048	1,101,773	250,899	230,687	45,569	524,399	41,375	1,073,606	97.4	28,167	—60,512	—194,552	—89,555
Louisiana Ry. & Nav. Co. of Tex.	April	206	95,137	4,835	104,749	19,420	15,350	3,287	48,591	5,588	92,644	88.4	12,105	7,904	—12,588	—24,472
	4 mos.	206	400,371	23,335	445,928	81,052	63,503	14,259	216,407	24,255	399,363	89.6	46,565	30,441	—51,466	—51,863
Louisville & Nashville	April	5,038	9,034,022	1,686,719	11,425,179	1,763,099	2,708,950	245,362	4,144,432	301,687	9,203,504	80.6	2,221,675	1,681,594	1,755,501	1,453,141
	4 mos.	5,038	38,439,332	7,365,504	48,476,778	6,680,407	11,065,328	1,012,826	17,525,096	1,160,672	37,544,927	77.4	10,931,851	8,563,481	8,218,565	7,134,286
Louisville, Henderson & St. Louis	April	199	209,448	53,678	278,783	74,975	53,400	7,604	101,610	10,289	247,878	88.9	30,905	18,163	12,667	52,335
	4 mos.	199	1,046,068	204,668	1,313,180	247,169	180,625	28,354	424,895	41,845	922,888	70.3	390,292	304,859	273,465	296,465
Maine Central	April	1,121	1,116,247	335,284	1,598,373	253,688	320,538	14,352	644,693	48,884	1,282,094	81.2	316,279	214,095	183,609	189,796
	4 mos.	1,121	4,958,974	1,264,095	6,777,850	1,014,580	1,328,441	51,708	2,829,354	197,143	5,420,664	80.0	1,357,186	929,862	853,160	949,358
Midland Valley	April	364	336,832	30,743	380,679	65,470	40,000	5,998	94,475	19,189	224,922	59.1	155,717	138,805	118,817	79,547
	4 mos.	364	1,185,346	125,416	1,364,478	184,165	146,868	25,339	357,746	73,371	786,888	57.7	577,590	509,922	437,364	370,809
Minneapolis & St. Louis	April	1,627	984,609	86,567	1,135,487	369,272	271,442	33,479	528,760	42,913	1,245,763	109.7	—110,276	—174,191	—196,028	—331,343
	4 mos.	1,527	3,965,271	403,677	4,626,126	737,378	1,103,156	143,755	2,161,262	172,012	4,315,389	93.3	310,737	53,568	—54,966	—179,661

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF APRIL AND FOUR MONTHS OF CALENDAR YEAR 1926—CONTINUED

Name of road	Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of Way and structures.	Maintenance of Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after rents. 1925.
Minneapolis, St. P. & S. S. Marie..April	4,400	$2,879,263	$429,117	$3,610,288	$555,067	$744,953	$86,770	$1,428,652	$125,995	$2,958,441	81.9	$651,847	$420,838	$339,847	$428,985
4 mos.	4,400	10,667,112	1,905,751	13,661,783	1,848,414	2,944,919	293,803	5,844,777	474,491	11,468,068	83.9	2,193,715	1,251,632	908,833	1,149,897
Duluth, South Shore & Atlantic..April	590	325,204	77,088	431,412	53,313	78,126	6,717	182,060	11,698	337,118	78.1	94,294	65,294	—52,539	52,054
4 mos.	590	1,267,398	321,292	1,703,489	204,496	318,731	27,722	763,223	46,864	1,371,061	80.5	332,428	216,428	135,540	156,466
Spokane International .....April	165	82,051	10,335	98,579	14,189	7,700	3,454	30,674	6,983	63,992	64.9	34,587	29,195	23,772	17,683
4 mos.	165	316,223	45,009	385,393	48,584	30,424	13,413	126,906	25,688	249,250	64.7	136,143	114,624	92,945	63,603
Mississippi Central .....April	161	113,916	9,166	127,201	18,777	26,720	8,143	34,840	9,382	97,854	76.9	29,347	20,546	27,231	32,923
4 mos.	161	467,182	39,080	524,137	69,112	104,083	30,294	141,774	31,613	376,868	71.9	147,269	107,903	131,153	115,964
Missouri & North Arkansas.....April	364	122,275	14,414	145,116	49,546	32,642	9,701	56,465	9,169	157,523	108.5	—12,407	—13,775	—25,607	8,790
4 mos.	364	460,751	60,988	555,777	186,103	105,393	32,259	220,183	30,393	572,331	102.9	—16,554	—25,562	—73,739	18,161
Missouri-Kansas-Texas .....April	1,799	2,069,454	347,845	2,313,224	262,714	662,007	61,254	712,717	99,614	1,772,979	67.8	840,245	621,401	656,817	782,936
4 mos.	1,799	8,408,160	1,453,835	10,671,107	986,232	2,594,614	233,615	2,943,131	363,427	7,131,163	66.8	3,539,944	2,695,651	2,895,396	3,138,936
Mo., Kansas Texas of Texas.....April	1,389	1,105,373	314,259	1,562,211	267,673	240,459	42,663	640,178	69,370	1,271,519	81.4	290,692	237,639	91,333	88,576
4 mos.	1,389	4,615,904	1,275,511	6,476,265	904,499	886,815	171,930	2,710,816	257,815	4,976,817	76.8	1,499,448	1,284,972	598,111	718,164
Missouri Pacific .....April	7,347	8,651,307	1,247,353	10,735,535	1,671,478	2,247,182	276,585	3,913,728	346,483	8,465,622	78.9	2,269,913	1,835,142	1,398,576	1,147,696
4 mos.	7,345	34,200,735	5,162,437	42,663,047	6,152,940	9,003,496	1,064,016	15,678,780	1,320,395	33,254,512	78.0	9,408,535	7,585,642	5,948,778	4,749,992
Gulf Coast Line.....April	922	1,358,388	169,960	1,637,921	218,938	227,168	39,055	460,507	55,217	1,006,465	61.4	631,456	565,763	439,092	505,346
4 mos.	922	4,235,779	723,798	5,291,618	884,662	854,782	157,536	1,541,995	215,336	3,620,539	68.4	1,671,079	1,411,982	1,106,451	1,400,126
International Great Northern....April	1,159	1,075,849	181,203	1,395,813	243,422	240,482	32,875	610,951	59,156	1,175,952	84.25	219,861	182,194	106,228	104,959
4 mos.	1,159	4,224,603	755,195	5,514,064	976,883	959,262	131,259	2,370,276	234,634	4,626,858	83.91	887,206	723,330	398,138	530,879
Texas & Pacific.....April	1,953	1,901,117	469,139	2,604,499	457,789	555,788	65,436	1,011,635	93,962	2,197,281	84.4	407,218	254,322	189,852	204,242
4 mos.	1,953	8,380,711	1,907,763	11,190,058	1,799,928	2,189,833	266,397	4,221,211	390,935	8,866,504	79.2	2,323,554	1,709,630	1,327,175	1,389,167
Mobile & Ohio.....April	1,161	1,450,385	105,278	1,635,552	228,203	300,839	55,833	561,292	47,797	1,194,275	73.0	441,277	336,020	272,453	290,225
4 mos.	1,161	5,746,469	452,097	6,538,949	884,404	1,219,343	203,070	2,248,259	183,240	4,737,298	72.4	1,801,651	1,415,208	1,181,223	1,079,470
Monongahela .....April	130	401,409	23,508	429,593	62,500	65,000	1,197	133,669	9,312	269,128	62.6	160,465	144,876	83,273	54,448
4 mos.	130	2,090,260	96,530	2,219,124	250,000	260,000	4,286	671,383	40,127	1,219,726	55.0	999,398	901,839	570,987	393,101
Monongahela Connecting .....April	7	.....	.....	163,719	18,676	31,604	374	72,769	3,204	126,627	77.3	37,092	31,537	32,281	14,140
4 mos.	7	.....	.....	783,474	76,600	142,651	1,498	367,397	12,793	600,939	76.7	182,535	161,285	150,909	85,213
Montour .....April	57	48,569	246	49,581	19,773	41,989	1,089	13,672	6,807	83,330	168.1	—33,749	—35,592	2,032	29,073
4 mos.	57	204,654	1,139	208,044	63,767	149,298	5,211	59,853	27,466	305,595	146.9	—97,551	—104,996	21,649	107,690
Nashville, Chatt. & St. Louis.....April	1,259	1,555,595	362,737	2,068,923	373,442	405,185	80,826	757,844	83,595	1,706,001	82.5	362,922	287,570	255,392	268,333
4 mos.	1,259	6,034,362	1,551,667	8,161,504	1,283,268	1,596,611	330,407	2,963,624	306,798	6,504,968	79.7	1,656,536	1,355,717	1,316,072	1,179,314
Nevada Northern .....April	165	62,420	7,671	76,296	11,402	5,302	913	14,139	4,316	36,232	47.5	40,064	31,300	33,126	29,120
4 mos.	165	245,255	32,165	304,822	53,776	25,054	3,469	59,584	19,178	161,771	53.1	143,051	101,332	106,452	91,490
Newburgh & South Shore.....April	7	.....	.....	177,590	19,044	44,787	.....	69,740	4,283	137,854	77.6	39,736	26,152	35,055	54,273
4 mos.	7	.....	.....	671,959	48,191	172,124	.....	296,297	16,423	533,035	79.3	138,924	86,557	110,937	157,745
New Orleans Great Northern.....April	274	203,565	26,327	237,885	35,016	48,230	7,275	73,890	11,098	175,755	73.9	62,130	45,520	35,319	44,316
4 mos.	274	883,995	97,494	1,010,067	120,845	196,904	27,717	297,086	45,060	688,787	68.2	321,280	245,643	189,186	169,596
New York Central .....April	6,930	19,944,654	7,656,289	31,854,318	4,017,813	7,427,347	386,703	10,644,822	1,296,306	24,240,617	76.1	7,613,701	5,356,007	5,285,617	5,214,021
4 mos.	6,930	79,017,755	30,170,151	124,724,006	14,940,003	20,226,668	1,561,187	44,355,562	4,887,760	96,748,932	77.6	27,975,074	19,472,448	19,124,055	17,566,041
Cincinnati Northern .....April	244	333,521	76,410	347,496	40,918	67,119	5,818	120,584	11,307	245,740	70.7	101,750	78,153	65,928	65,524
4 mos.	244	1,471,563	26,845	1,522,290	157,460	265,191	22,955	522,639	43,177	1,007,123	66.2	515,167	413,331	307,743	265,305
Cleve., Cin., Chic. & St. Louis...April	2,391	5,493,244	1,269,199	7,448,251	848,497	1,674,641	132,870	2,632,986	259,095	5,617,442	75.4	1,830,809	1,407,978	1,303,827	1,122,969
4 mos.	2,391	22,140,172	5,005,137	29,591,472	2,993,505	6,524,735	516,190	11,166,446	1,114,296	22,616,947	76.4	6,974,525	5,211,572	5,039,867	5,272,435
Indiana Harbor Belt.....April	116	.....	.....	905,788	86,906	147,626	4,605	368,145	31,323	638,605	70.5	267,183	218,263	176,574	135,903
4 mos.	116	.....	.....	3,581,638	361,755	482,756	19,771	1,686,704	124,809	2,674,970	74.7	906,668	729,818	547,203	434,067
Michigan Central .....April	1,871	5,551,742	1,602,330	7,946,302	840,097	1,618,223	107,918	2,501,444	211,958	5,362,145	67.5	2,584,157	2,070,287	1,933,074	1,797,668
4 mos.	1,871	21,349,098	6,381,007	30,720,274	2,888,859	6,119,038	454,101	10,112,179	1,116,855	20,992,175	68.3	9,728,099	7,757,586	7,344,189	6,527,030
Pittsburgh & Lake Erie.....April	231	2,243,297	231,148	2,583,865	341,103	894,769	23,157	836,455	86,939	2,184,292	84.5	399,573	227,802	619,828	706,783
4 mos.	231	9,596,894	946,212	10,919,491	1,445,233	3,432,768	100,084	3,566,116	319,094	8,868,556	81.2	2,050,935	1,320,791	2,931,878	3,214,272
New York, Chicago & St. Louis....April	1,691	4,264,313	144,380	4,558,998	525,572	866,117	118,715	1,568,048	161,888	3,246,592	71.2	1,312,466	1,061,045	921,119	790,151
4 mos.	1,691	16,876,532	516,097	17,977,906	2,032,845	3,461,765	483,636	6,348,310	641,613	12,926,676	71.9	5,051,280	4,044,214	3,461,095	3,372,502
N. Y., New Haven & Hartford....April	1,918	5,895,146	4,044,650	11,285,557	1,329,123	2,343,095	77,632	3,766,920	303,885	7,990,642	70.8	3,294,915	2,852,283	2,317,252	2,052,544
4 mos.	1,918	21,532,768	15,836,817	42,348,622	4,949,841	9,034,753	295,775	15,557,436	1,190,185	31,706,988	74.9	10,641,634	8,851,253	6,938,848	6,869,313
Central New England.....April	279	620,869	3,420	641,466	94,364	95,130	6,989	196,639	16,773	409,895	63.9	231,571	205,105	150,291	125,314
4 mos.	279	2,182,913	16,914	2,273,751	368,228	364,483	26,746	789,883	66,124	1,615,464	71.0	658,287	550,874	375,928	575,872
New York Connecting.....April	20	188,271	.....	221,514	16,390	13,787	.....	53,486	1,491	85,154	38.4	136,360	98,360	88,554	89,163
4 mos.	20	784,889	.....	902,557	85,211	48,538	.....	207,558	6,250	347,557	38.5	555,000	403,000	370,773	425,241
New York, Ontario & Western....April	569	889,754	98,464	1,165,386	116,881	243,146	15,984	471,902	33,957	883,067	75.8	282,319	232,293	174,247	100,818
4 mos.	569	2,313,752	363,101	3,301,797	384,153	784,533	63,593	1,657,168	139,666	3,031,650	91.8	270,147	70,003	—100,676	—113,007
Norfolk & Western.....April	2,241	7,638,670	600,768	8,613,640	1,213,776	1,793,284	107,165	2,277,061	160,413	5,545,898	64.4	3,067,742	2,316,131	2,614,319	1,538,101
4 mos.	2,241	31,676,418	2,389,682	35,365,754	4,784,867	7,046,413	429,825	9,645,870	638,544	22,557,186	63.8	12,808,568	9,801,697	11,012,850	7,833,756
Norfolk Southern .....April	931	778,401	66,868	890,650	111,610	142,475	23,648	318,474	28,304	612,224	68.7	278,426	229,627	172,699	118,873
4 mos.	931	2,762,193	264,452	3,199,173	407,818	483,394	91,450	1,206,016	110,920	2,261,947	70.7	937,226	744,476	577,936	472,374
Northern Pacific .....April	6,682	5,998,944	824,864	7,459,141	1,376,196	1,450,086	257,682	2,559,118	233,555	5,908,160	79.2	1,550,981	888,825	1,320,960	773,917
4 mos.	6,682	22,275,101	3,567,405	28,240,154	4,181,722	5,823,008	843,164	10,487,865	987,576	22,581,484	80.0	5,658,670	3,006,950	4,605,542	3,373,557
Northwestern Pacific .....April	493	313,961	149,266	514,118	109,008	85,032	6,462	205,049	19,031	424,571	82.6	89,547	48,516	35,701	8,460
4 mos.	485	1,132,341	561,696	1,870,080	396,001	323,226	22,595	815,826	72,666	1,629,788	87.2	240,292	76,072	45,247	—15,014

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF APRIL AND FOUR MONTHS OF CALENDAR YEAR 1926—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of—Way and structures.	Maintenance of—Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after rents, 1925.
Pennsylvania R. R.	April	10,518	$38,325,879	$11,995,167	$55,417,842	$7,543,873	$13,334,666	$706,247	$20,171,005	$1,589,461	$44,066,305	79.5	$11,351,537	$8,717,422	$7,378,103	$6,782,982
	4 mos.	10,518	154,461,379	45,865,211	219,621,273	29,692,770	54,072,791	2,760,454	85,035,609	6,255,892	180,798,829	82.3	38,822,444	30,214,489	25,300,401	21,879,476
Baltimore, Chesapeake & Atlantic	April	130	72,320	27,697	105,416	11,832	52,126	1,626	71,487	3,137	140,208	133.0	—34,792	—38,215	—39,885	—34,018
	4 mos.	130	241,439	80,397	343,461	30,769	130,073	6,184	284,221	13,405	464,652	135.3	—121,191	—122,889	—128,401	—136,271
Long Island	April	397	1,027,041	1,843,276	3,109,645	485,045	539,666	26,577	1,333,612	68,547	2,460,393	79.1	649,252	514,540	294,788	325,940
	4 mos.	397	3,404,153	6,782,185	11,014,067	1,715,930	2,098,989	100,954	5,214,299	302,226	9,469,722	86.0	1,544,345	1,248,871	728,362	932,202
West Jersey & Seashore	April	378	437,993	539,854	1,039,245	206,903	155,684	16,881	458,401	27,740	856,614	83.4	172,631	106,425	85,124	136,814
	4 mos.	378	1,518,964	1,849,156	3,572,507	787,491	604,148	57,251	1,795,268	101,879	3,348,285	93.7	224,222	182,464	93,273	198,596
Peoria & Pekin Union	April	19	18,534	2,714	142,766	18,997	14,323	834	58,505	8,372	101,031	70.8	41,735	24,735	47,653	31,850
	4 mos.	19	87,020	11,456	601,560	50,895	54,818	3,459	259,371	33,450	401,993	66.8	199,567	132,567	221,419	193,743
Pere Marquette	April	2,243	3,224,528	300,808	3,757,002	364,852	760,422	51,337	1,282,594	200,044	2,669,410	71.0	1,087,592	884,016	699,260	502,406
	4 mos.	2,253	11,937,367	1,213,509	14,038,495	1,050,080	3,018,553	215,839	5,096,661	499,335	9,922,697	70.7	4,115,798	3,312,081	2,834,076	2,103,191
Pittsburg & Shawmut	April	102	134,563	5,270	141,973	19,754	43,455	1,427	37,492	6,686	108,814	76.6	33,159	32,971	45,293	4,533
	4 mos.	102	508,286	20,907	537,254	65,994	168,940	5,567	151,722	27,007	419,230	78.0	118,024	117,429	170,596	68,351
Pittsburgh & West Virginia	April	92	328,590	6,113	366,805	30,118	97,138	7,125	74,111	11,801	234,848	64.0	131,957	82,030	139,147	137,881
	4 mos.	92	1,472,425	24,833	1,633,168	107,947	356,398	31,281	328,125	65,196	940,566	57.6	692,602	487,979	791,913	574,011
Pittsburg, Shawmut & Northern	April	210	137,087	3,177	142,808	25,376	32,314	1,702	57,400	5,591	122,383	85.7	20,425	17,380	5,712	13,894
	4 mos.	210	555,840	12,932	581,469	88,058	143,369	7,229	226,997	22,860	488,513	84.0	92,956	80,780	53,026	83,765
Quincy, Omaha & Kansas City	April	249	46,254	14,313	69,514	39,338	12,220	794	30,862	2,686	85,734	123.3	—16,220	—21,686	—24,117	—21,687
	4 mos.	250	180,727	71,674	282,630	93,366	64,852	3,518	140,835	10,288	312,182	110.4	—29,552	—50,583	—61,215	—102,797
Reading Company	April	1,138	7,163,198	760,386	8,299,774	1,094,644	1,834,877	85,588	2,867,803	177,112	6,059,128	73.0	2,240,646	1,765,881	1,883,939	1,572,363
	4 mos.	1,137	26,337,380	3,106,902	30,868,985	3,829,693	7,027,121	284,190	11,645,729	713,806	23,498,627	76.1	7,370,358	5,565,635	6,302,683	6,104,355
Atlantic City	April	161	131,406	161,851	312,407	74,728	30,856	4,639	186,947	5,342	302,470	96.8	9,937	—24,873	—52,285	—58,203
	4 mos.	161	508,429	531,441	1,109,897	363,779	125,187	19,960	715,734	20,872	1,245,717	112.2	—135,820	—246,728	—355,106	—431,345
Perkiomen	April	41	96,971	4,263	104,598	8,721	6,542	107	48,461	1,041	64,914	62.1	39,684	32,673	27,641	24,390
	4 mos.	41	388,201	18,497	419,912	30,356	24,094	431	183,387	3,899	242,347	57.7	177,565	147,362	126,729	110,447
Port Reading	April	19	147,103	.....	207,021	20,717	5,199	229	69,702	1,353	97,200	47.0	109,821	93,227	36,811	—70,076
	4 mos.	19	709,556	.....	918,799	69,757	32,743	916	337,353	10,145	450,911	49.1	467,888	404,392	118,966	32,606
Richmond, Fred'ksburg & Potomac	April	117	521,374	442,259	1,175,692	109,624	179,844	9,464	371,682	44,563	756,092	64.3	419,600	336,159	271,994	315,426
	4 mos.	117	1,890,390	1,837,492	4,580,270	343,105	693,353	34,554	1,477,213	149,957	2,862,480	62.5	1,717,790	1,388,842	1,170,950	1,139,626
Rutland	April	413	335,215	116,026	574,493	85,310	118,108	10,252	223,385	14,026	452,852	78.8	121,641	90,436	95,335	66,048
	4 mos.	413	1,268,586	433,068	2,146,198	347,158	455,489	39,075	896,649	53,936	1,798,790	83.8	347,408	238,668	281,251	133,982
St. Louis-San Francisco	April	4,986	5,200,462	1,189,678	7,014,646	878,818	1,546,810	106,284	2,398,501	240,046	5,114,022	72.9	1,900,624	1,525,518	1,603,534	1,446,520
	4 mos.	4,986	21,291,929	4,943,419	28,302,893	3,274,441	5,603,770	423,061	9,843,257	970,103	20,021,475	70.7	8,281,418	6,785,049	6,723,080	6,428,224
Ft. Worth & Rio Grande	April	233	72,266	12,549	94,341	26,335	19,662	3,231	59,194	6,591	114,979	121.9	—26,638	—24,938	—32,396	—19,148
	4 mos.	233	315,383	59,801	414,352	91,383	79,247	13,254	213,550	21,745	418,766	101.1	—4,414	—21,182	—53,446	—21,325
St. Louis, San Francisco & Tex.	April	137	134,703	11,988	152,420	23,234	26,714	4,892	53,267	9,126	117,233	76.9	35,187	32,408	8,528	9,567
	4 mos.	137	542,117	47,924	614,740	82,035	98,595	20,092	224,700	29,260	454,554	73.9	160,186	148,524	49,401	109,371
St. Louis Southwestern	April	940	1,174,138	99,654	1,342,344	161,416	285,861	56,021	359,937	58,545	933,885	69.6	408,459	362,308	285,967	257,007
	4 mos.	940	5,177,101	458,274	5,951,330	891,350	1,095,053	229,057	1,535,698	236,247	4,047,341	68.0	1,903,989	1,638,109	1,295,536	1,215,518
St. Louis Southwestern of Texas	April	807	414,599	52,341	515,752	199,513	135,603	24,044	225,468	33,496	622,444	120.7	—106,692	—134,598	—83,399	—27,299
	4 mos.	807	1,890,111	223,214	2,308,955	719,210	524,436	97,863	974,936	131,063	2,458,629	106.5	—149,674	—261,342	—51,847	12,180
San Antonio, Uvalde & Gulf	April	318	120,097	20,460	150,992	30,905	14,033	3,441	38,322	4,166	90,867	60.2	60,125	56,246	40,957	38,064
	4 mos.	318	476,045	81,076	601,266	119,898	62,854	14,091	187,646	24,917	409,406	68.1	191,860	177,871	107,718	81,717
Seaboard Air Line	April	3,928	4,207,603	1,027,788	5,778,721	685,013	847,688	208,074	2,229,202	190,470	4,258,096	73.7	1,520,625	1,229,483	936,774	826,173
	4 mos.	3,928	16,997,308	5,361,157	24,623,166	3,130,306	3,573,283	814,000	9,264,513	755,182	18,012,367	73.2	6,610,799	5,447,365	3,889,117	3,348,994
Southern Ry	April	6,790	9,593,107	2,383,981	13,033,615	1,801,875	2,279,086	257,879	4,442,464	339,684	9,196,249	70.6	3,837,366	2,981,939	2,785,013	2,650,292
	4 mos.	6,790	37,046,472	9,893,820	50,978,469	7,208,701	8,991,910	997,831	17,758,202	1,308,340	36,618,842	71.8	14,359,627	11,044,269	10,109,775	9,950,673
Alabama Great Southern	April	318	681,560	142,753	880,923	129,725	194,895	20,276	271,059	26,034	648,308	73.6	232,615	175,815	185,722	233,540
	4 mos.	318	2,677,333	586,610	3,479,142	509,254	684,269	84,015	1,006,865	97,056	2,466,699	70.9	1,012,443	780,927	820,234	828,154
Cin., New Orleans & Tex. Pacific	April	338	1,422,377	352,280	1,893,321	282,341	382,270	43,991	541,008	56,196	1,327,190	70.1	566,131	417,414	432,261	405,654
	4 mos.	338	5,735,126	1,536,276	7,749,642	1,067,617	1,432,450	174,588	2,234,156	216,127	5,220,429	67.4	2,529,213	2,034,340	2,013,846	2,065,475
Georgia Southern & Florida	April	401	405,664	150,241	593,537	85,122	87,606	18,604	224,745	13,022	433,409	73.0	160,128	130,833	78,230	74,145
	4 mos.	401	1,758,047	706,892	2,641,045	338,038	347,571	72,816	1,038,686	50,236	1,865,900	70.7	775,145	645,657	400,562	315,240
New Orleans & Northeastern	April	207	410,221	73,158	514,827	76,093	83,493	11,187	147,789	16,515	358,820	65.8	126,007	109,669	75,457	130,772
	4 mos.	207	1,665,059	301,908	2,102,753	274,054	314,716	49,126	615,414	58,450	1,326,518	63.1	776,235	554,746	405,194	458,036

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF APRIL AND FOUR MONTHS OF CALENDAR YEAR 1926—CONTINUED

Name of road		Average mileage operated during period.	Operating revenues: Freight.	Passenger.	Total (inc. misc.)	Operating expenses: Maintenance of: Way and structures.	Equipment.	Traffic.	Transportation.	General.	Total.	Operating ratio.	Net from railway operation.	Operating income (or loss).	Net after rents.	Net after rents, 1925.
Northern Alabama	April	110	$112,083	$7,576	$123,222	$23,043	$4,893	$2,075	$41,842	$2,806	$74,658	61.1	$48,564	$43,540	$28,793	$16,026
	4 mos.	110	451,109	34,811	497,103	96,236	22,350	8,943	164,239	11,550	303,273	61.0	193,830	171,194	67,458	88,181
Southern Pacific	April	8,736	11,160,854	3,157,299	15,834,052	2,627,051	2,969,157	344,071	5,345,775	621,142	12,090,833	76.4	3,743,219	2,466,974	2,340,702	1,603,982
	4 mos.	8,760	44,240,197	13,336,283	63,058,828	10,027,252	11,593,428	1,349,451	21,629,658	2,427,952	47,768,749	75.8	15,290,079	9,970,024	9,449,691	7,159,710
Atlantic Steamship Lines	April	...	809,803	41,230	1,048,354	17,529	204,510	18,533	617,271	33,416	891,259	85.0	157,095	149,327	149,410	—2,913
	4 mos.	...	3,312,170	148,899	4,088,963	63,053	682,611	61,385	2,601,271	134,841	3,543,161	86.7	544,902	503,340	503,029	—345,127
Galveston, Harrisb'g & S. Antonio	April	2,104	1,685,530	428,774	2,276,752	549,432	502,084	59,841	880,363	106,733	2,121,019	93.2	155,773	55,827	—14,877	52,638
	4 mos.	2,104	6,780,765	1,789,465	9,232,081	1,828,692	1,985,525	226,168	3,435,445	431,411	7,994,163	86.6	1,237,918	820,588	446,328	644,205
Houston & Texas Central	April	891	736,740	224,697	1,037,743	225,780	225,476	29,662	373,010	48,942	905,310	87.2	132,433	70,304	47,097	—40,398
	4 mos.	891	3,087,836	854,473	4,278,109	847,505	969,913	112,685	1,495,908	192,508	3,622,050	84.7	656,059	396,707	354,682	612,613
Houston, East & West Texas	April	191	207,084	35,779	255,911	52,758	55,669	3,845	78,666	9,598	200,277	78.3	55,634	40,271	31,912	33,390
	4 mos.	191	819,913	141,033	1,012,832	192,847	214,749	16,185	305,174	40,001	766,401	75.7	246,431	186,730	129,845	61,434
Louisiana Western	April	207	200,723	71,525	293,262	51,459	73,405	16,331	99,205	20,433	264,675	90.3	28,587	5,436	4,469	—6,492
	4 mos.	207	868,837	309,645	1,268,611	195,990	241,643	64,191	400,083	80,784	1,000,278	78.8	268,333	164,987	135,396	83,185
Morgan's L. & T. R. R. & S. S. Co.	April	400	411,214	116,912	583,495	166,927	165,884	24,524	283,016	36,890	681,179	116.7	—97,684	—148,709	—177,495	—145,126
	4 mos.	400	1,884,810	510,529	2,642,156	634,346	658,738	96,026	1,173,376	147,236	2,728,416	103.3	—86,260	—290,539	—394,955	—338,117
Texas & New Orleans	April	544	587,186	144,686	786,944	160,304	195,813	17,081	259,925	36,066	673,439	85.6	113,505	78,068	42,136	47,198
	4 mos.	544	2,529,599	583,385	3,333,496	667,974	672,898	66,237	1,244,691	141,660	2,808,369	84.2	525,127	384,167	174,735	370,217
Spokane, Portland & Seattle	April	554	460,310	94,810	610,977	110,021	90,451	9,613	186,399	21,034	424,265	69.4	186,712	109,513	102,378	79,401
	4 mos.	554	1,784,040	377,838	2,388,414	357,607	378,307	38,087	751,159	83,224	1,635,259	68.5	753,155	444,559	396,264	327,162
Tennessee Central	April	296	234,587	28,236	276,283	59,573	46,031	8,404	99,934	12,300	226,104	81.8	50,179	43,717	21,924	25,030
	4 mos.	296	906,644	120,599	1,086,188	225,294	177,624	30,715	398,763	48,946	880,170	81.0	206,018	181,397	87,265	73,711
Term. Railroad Ass'n of St. Louis	April	55	.....	.....	1,080,771	146,657	100,209	2,313	414,679	20,721	687,833	63.6	392,938	280,299	363,680	274,930
	4 mos.	55	.....	.....	4,398,417	558,546	393,164	9,859	1,758,176	87,368	2,820,410	64.1	1,578,007	1,147,947	1,477,496	1,338,466
Toledo, Peoria & St. Louis	April	248	67,618	20,979	98,179	20,568	28,630	1,763	59,974	6,556	117,491	119.7	—19,312	—27,046	—26,516	—38,913
	4 mos.	248	323,797	88,007	449,130	78,579	120,858	7,402	254,611	26,648	487,955	108.6	—38,825	—67,593	—70,014	—110,907
Trinity & Brazos Valley	April	367	115,612	9,653	130,701	46,318	34,453	4,194	69,456	11,991	166,288	127.2	—35,587	—43,302	—61,088	—93,266
	4 mos.	367	537,668	35,667	599,543	197,905	129,987	17,700	323,978	51,992	720,314	120.1	—120,771	—151,601	—237,743	24,203
Ulster & Delaware	April	128	55,433	7,528	98,319	15,615	18,572	1,389	48,325	5,484	89,385	90.9	8,934	3,183	—212	5,488
	4 mos.	128	133,132	32,322	292,221	56,660	68,375	5,314	172,997	22,787	326,133	111.6	—33,912	—56,913	—63,951	—50,561
Union Railroad of Penna	April	45	.....	.....	967,874	95,092	200,311	158	442,881	11,736	750,178	77.5	217,696	189,408	236,782	214,336
	4 mos.	45	.....	.....	3,493,167	372,767	860,322	705	1,749,110	40,157	3,023,061	86.5	470,106	387,952	564,007	454,818
Union Pacific	April	3,691	6,058,379	1,184,173	8,023,782	1,273,715	1,842,772	199,253	2,235,998	313,804	6,020,914	75.0	2,002,868	1,303,735	1,203,724	1,290,123
	4 mos.	3,691	23,983,790	4,692,719	31,509,964	3,639,710	7,291,278	637,963	9,103,583	1,188,970	22,459,407	71.3	9,050,557	6,271,771	6,061,100	5,672,172
Oregon Short Line	April	2,537	2,224,497	292,153	2,722,410	583,930	512,635	55,034	806,838	116,523	2,127,822	78.2	594,588	336,092	280,385	87,328
	4 mos.	2,501	8,967,858	1,291,600	11,015,853	1,886,795	2,149,331	194,513	3,384,387	465,091	8,294,928	75.3	2,720,925	1,688,930	1,481,481	1,095,484
Oregon, Wash. R. R. & Nav. Co.	April	2,237	1,776,701	272,197	2,263,732	507,786	364,299	77,728	802,236	114,319	1,889,412	83.5	374,320	203,162	118,064	—137,370
	4 mos.	2,237	6,664,411	1,169,670	8,586,641	1,735,998	1,499,815	271,399	3,226,808	458,271	7,292,590	84.9	1,294,051	608,879	279,095	2,189
Los Angeles & Salt Lake	April	1,207	1,432,257	343,868	1,943,093	440,438	396,641	76,902	643,315	67,524	1,692,641	87.1	250,452	113,899	26,890	74,194
	4 mos.	1,207	5,732,639	1,340,074	7,749,458	1,719,690	1,652,751	260,662	2,557,208	273,957	6,740,982	87.0	1,008,476	473,062	137,792	386,646
St. Joseph & Grand Island	April	258	250,882	16,122	283,539	58,041	44,489	3,085	96,203	14,414	216,232	76.3	67,307	48,020	36,355	11,994
	4 mos.	258	1,078,964	68,548	1,208,195	183,544	180,093	12,159	401,198	59,195	836,189	69.2	372,002	282,813	225,469	143,797
Utah	April	111	92,281	136	92,887	10,472	38,331	343	22,428	5,604	77,178	83.1	15,709	6,224	3,767	19,947
	4 mos.	111	488,655	628	491,234	50,198	153,778	1,415	115,395	24,850	345,567	70.4	145,667	107,729	92,539	131,028
Virginian	April	545	1,294,509	56,761	1,469,559	219,679	356,055	12,723	338,959	29,987	954,767	65.0	514,792	378,788	460,712	320,478
	4 mos.	545	5,970,311	240,853	6,661,694	807,263	1,423,816	51,145	1,517,806	123,651	3,916,612	58.8	2,745,082	2,203,955	2,534,539	1,803,510
Wabash	April	2,524	4,546,263	712,340	5,689,363	851,218	1,005,142	139,924	2,165,734	175,128	4,329,436	76.1	1,359,927	1,059,134	736,065	625,374
	4 mos.	2,524	17,981,767	2,780,544	22,341,598	2,708,300	3,997,935	592,780	8,827,436	692,240	16,875,563	75.5	5,466,035	4,314,878	3,126,787	2,591,270
Western Maryland	April	804	1,617,315	45,262	1,724,216	238,136	421,808	34,232	485,159	47,548	1,235,909	71.7	488,307	408,307	374,564	332,750
	4 mos.	804	6,849,341	186,274	7,257,345	889,217	1,674,061	144,020	2,236,839	180,932	5,162,945	71.1	2,094,400	1,779,400	1,636,430	1,374,902
Western Pacific	April	1,042	862,594	133,903	1,067,293	210,860	200,910	37,265	375,392	39,747	880,819	82.5	186,474	77,358	162,299	168,640
	4 mos.	1,042	3,474,003	471,667	4,190,028	636,652	829,984	147,321	1,528,809	144,935	3,353,197	80.0	836,831	455,247	840,983	716,451
Wheeling & Lake Erie	April	511	1,536,939	34,690	1,658,400	213,209	428,259	32,700	477,088	50,277	1,203,039	72.5	455,361	319,875	310,410	374,350
	4 mos.	511	5,831,820	144,414	6,301,887	727,163	1,617,512	127,782	1,938,587	188,853	4,606,500	73.1	1,695,387	1,169,254	1,198,752	984,806

General News Department

(Continued from page 1687)

interest will be served best in this consolidated case by an authoritative and epoch-making decision construing the law in accordance with the purpose of its authors. Useless duplication and ruinous competition should be excluded from the Texas South Plains. The prudence and foresight of the pioneer railroad builder should be rewarded."

Railways Earned 4.65 Per Cent in April

The net railway operating income of the Class I railroads in April amounted to $76,281,630 which was at the annual rate of return of 4.65 per cent on their property investment, according to reports compiled by the Bureau of Railway Economics. In April last year, their net railway operating income was $66,465,322, or 4.14 per cent.

Gross operating revenues for the month of April amounted to $499,661,968 compared with $473,703,664 in April, 1925, or an increase of 5.5 per cent. Operating expenses totaled $384,833,080 compared with $370,789,072, or an increase of 3.8 per cent. Thirty-one Class I roads operated at a loss in April this year of which nine were in the Eastern district, one in the Southern and twenty-one in the Western district.

For the first four months in 1926, Class I railroads had a net railway operating income of $299,867,494 at the annual rate of return of 4.76 per cent. During the corresponding period last year, the net railway operating income totaled $271,095,577 or 4.41 per cent.

Gross operating revenues for the first four months in 1926 amounted to $1,971,315,727 compared with $1,900,608,485, an increase of 3.7 per cent. Operating expenses for the four months period this year totaled $1,520,545,241 compared with $1,487,870,526, an increase of 2.2 per cent.

In the Eastern district the net railway operating income for the Class I railroads during the first four months totaled $154,146,120, at the annual rate of return of 5.61 per cent. For the same period last year, their net railway operating income was $139,100,470, or 5.17 per cent. Gross operating revenues for the four months totaled $987,766,903, an increase of 3.8 per cent, while operating expenses totaled $765,869,017, an increase of 2.2 per cent. For April the net railway operating income in the Eastern district was $44,998,768 compared with $39,190,976 in April last year.

In the Southern district for four months the net railway operating income was $55,808,605, at the rate of 5.71 per cent, as compared with $53,184,680, at rate of 5.70 per cent. Gross operating revenues for the first four months totaled $299,172,302, an increase of 8.9 per cent, while operating expenses amounted to $218,796,569, an increase of 8.6 per cent. The net railway operating income in the Southern district in April amounted to $12,008,148 while in the same month last year, it was $12,135,985.

In the Western district for the first four months the net railway operating income was $89,912,769, at the annual rate of return of 3.50 per cent. For the first four months last year, the roads in that district earned $78,810,427, at the rate of 3.12 per cent. Gross operating revenues for the first four months amounted to $684,375,922, an increase of 1.5 per cent, while operating expenses totaled $535,879,655, a decrease of one-fifth of one per cent compared with the first four months last year. For the month of April, the net railway operating income in the Western district amounted to $19,274,714. The net railway operating income of the same roads in April last year totaled $15,138,370.

The summary follows:

	1926	1925
Month of April		
Total operating revenues	$499,661,968	$473,703,664
Total operating expenses	384,833,080	370,789,072
Taxes	30,188,496	28,166,558
Net railway operating income	76,281,630	66,465,322
Operating ratio	77.02	78.27
Rate of return on property investment, per cent	4.65	4.14
Four Months Ended April 30		
Total operating revenues	$1,971,315,727	$1,900,608,485
Total operating expenses	1,520,545,241	1,487,870,526
Taxes	117,878,918	110,479,748
Net railway operating income	299,867,494	271,095,577
Operating ratio	77.13	78.28
Rate of return on property investment, per cent	4.76	4.41

Traffic News

The Akron (Ohio) Traffic Club will hold its ninth annual picnic on Wednesday, June 16, at Turkeyfoot Lake, Akron.

An effort is being made by chambers of commerce and other bodies in north and east Texas to secure the construction of an extension of the Atchison, Topeka & Santa Fe from Tulsa, Okla., through Paris, Tex., to Longview, about 250 miles.

The United States Senate on June 3 passed the bill, S. 2615, as amended by the committee on interstate commerce, authorizing railroads to carry any totally blind person accompanied by a guide at the ordinary fare charged to one person, under such reasonable regulations as may have been established by the carrier.

The Boston & Maine has established an Industrial and Agricultural Bureau, with headquarters at Boston. The manager is A. N. Payne. Colonel Payne's plans contemplate the establishment between the railroad company and chambers of commerce, agricultural colleges, and other farm and mercantile interests, the closest possible co-operation and friendly intercourse.

The Women's Traffic Club of Los Angeles (Cal.) held its first annual banquet on May 29. Officers were elected for the ensuing year as follows: President, Miss Emma A. Kentz (U. P.); first vice-president, Helen C. Hughes (Santa Fe); second vice-president, Gertrude B. Sears; recording secretary, Esther M. Brady; corresponding secretary, Gladys Meredith; secretary-treasurer, Myrtle A. Cranch.

The next meeting of the Southwest Shippers' Advisory Board will be held at Houston, Tex., on June 17. Special attention will be given to the heavy seasonal traffic which begins with the grain movement the latter part of June. The Southwestern Industrial Traffic League also will hold a meeting at Houston immediately following the business session of the board meeting and the Texas Industrial Traffic League will hold a meeting at Houston on June 19.

C. & E. I. Market Lectures

A marketing train, specializing in fruits and vegetables and carrying exhibits and motion pictures for the instruction and entertainment of farmers and others, is to be run by the Chicago & Eastern Illinois over the lines of that road in Indiana on Monday, June 28, and the five following days. On the train there will be ten or more specialists to give lectures in agriculture, horticulture and marketing. Stops of about three hours each will be made at Terre Haute, Farmersburg, Sullivan, Paxton, Carlisle, Vincennes, Oaktown, Decker, Hazleton, Patoka, Princeton, Owensville, Poseyville, Mt. Vernon, Ft. Branch and Evansville. Luther Fuller, general agricultural agent of the C. & E. I. says that this will be the first enterprise of this character to feature marketing alone. In order to meet competition from other sections, Indiana must ship a uniform pack of sound quality. Competition is getting stronger each year. Southwestern Indiana as a fruit and vegetable section, says Mr. Fuller, has the right soil and climate and is practically at the back door of some of the world's largest markets.

Motor Transport News

The application of the Motor Travel Bureau, Inc., which operates bus lines between Kansas City, Mo., and Denver, Colo., for permission to extend its lines was taken under advisement by the Kansas Public Service Commission on June 1, following a hearing in which the extension was opposed by the Union Pacific, the Chicago, Rock Island & Pacific and the Missouri Pacific. The railroads contended that the extension of bus business into cross-state fields might compel the railroads to abandon passenger service on their branch lines.

Commission and Court News

Interstate Commerce Commission

Southern Class Rates

The commission announced on June 9 that it would not issue at this time orders putting into effect its findings in the Southern class rate investigation in view of the agreement of the railroads involved to co-operate with the commission in carrying them into effect by voluntarily compiling tariffs which can be simply and effectively applied. The Southern class rate revision is more comprehensive than any previously attempted in this country, according to the commission.

I. C. C. Desires Figures on "Rate Levels"

Traffic and accounting officers and counsel of railroads in all parts of the country held a conference with the Interstate Commerce Commission officials in charge of the commission's general rate structure investigation, at Washington on June 3, to discuss the details of a questionnaire which the commission desires to send out for the purpose of collecting data as to typical rate levels for the average haul of seventeen principal commodities. The railroad men considered the suggestion, as made, impracticable; and it was finally decided that the railroads in the three principal districts, eastern, western and southern, should submit suggestions by June 17 as to how the desired information could be compiled by districts.

Joint Passenger Train Service Authorized

The commission has approved a modified plan proposed by the Northern Pacific and the Minneapolis, St. Paul & Sault Ste. Marie for the operation of joint passenger train service between Minneapolis, St. Paul and Duluth, Minn., and a division of the earnings, in place of a pooling arrangement previously authorized by the commission, which was not put into effect. The report of the commission on further hearing says in part:

The precise reason for the proposed modification of the approved pooling arrangement and the regrettable partial abandonment of the original plan for the elimination of wasteful passenger train service is not definitely stated of record, but the inference may be drawn that the change is attributable to competitive action on the part of the Great Northern Railway.

The modification of the original plan is that, instead of a withdrawal of two trains daily in each direction, but one will be withdrawn from the service. The train so to be discontinued is the Soo night train in each direction, the Northern Pacific night train to continue in service. A late afternoon fast non-stop train will be operated by the Northern Pacific instead of by the Soo, as first planned, and both lines will operate early afternoon fast trains. Each line will operate a morning train to care for local traffic.

The contract provides that the total through revenues of all regular and special passenger trains, derived monthly from passenger fares, including surcharge, parlor car and chair-car fares, baggage collections, and revenues from special baggage cars earned on business between or through the Twin Cities and the head of the lakes, shall be divided monthly between the applicants in the percentages which each applicant's through revenues bear to the total revenues of both in the combined corresponding months of the test period embracing the years 1924 and 1925, save that the percentages shall be adjusted to make proper allowance to the Northern Pacific for the operation of one more afternoon train than the Soo is to operate. The applicants are to estimate and agree upon the net savings to result from the discontinuance of the Soo night trains and the increased cost to the Northern Pacific of hauling additional sleepers in its night trains; the Soo to pay to the Northern Pacific monthly one-twelfth of one-half of the aggregate annual savings and cost so estimated and agreed upon. The contract is to continue in force for three years after the joint operation shall become effective.

State Commissions

The New York State Transit Commission, on June 7, adopted an order calling for the elimination of four highway grade crossings—Lawrence street, Old Lawrence street, Bridge street and Myrtle avenue—on the Whitestone branch of the Long Island. The changing of grades at these crossings will necessitate the elevation of the tracks for a long distance and the construction of a new drawbridge over Flushing River; and the total estimated cost is $1,028,000. The railroad company has objected to the proposals of the state for expenditures on the Whitestone branch on the ground that the traffic of the branch is unprofitable.

Personnel of Commissions

Thomas A. Gillis, assistant to the secretary of the Interstate Commerce Commission, has been appointed assistant secretary to fill the vacancy caused by the death of Alfred Holmead. Mr. Gillis has served with the Interstate Commerce Commission in various executive capacities since 1907.

United States Supreme Court

Duty Toward Section Foreman Going to Work on Motor Car

An experienced section foreman was overtaken by a train and killed when going to his work on a three wheeled velocipede that fitted the rails, which he used when inspecting the track, and also to go to his work from his house, a mile distant, by permission of his immediate superior, the Supervisor of Track. In an action for his death under the federal Employers' Liability Act the question was whether as towards him the railroad owed a duty to keep a lookout, or whether he took the risk, it appearing that the engineer and fireman of the train were not on the lookout. The Supreme Court of the United States, reversing judgment for the plaintiff by the Supreme Court of Appeals of Virginia, says that if the accident had happened an hour later when the deceased was inspecting the track he would have been held to have assumed the risk, and to have understood, as he instructed his men, that he must rely upon his own watchfulness and keep out of the way, the duty of the railroad company toward this class of employees not being affected by that which it might owe to others; and that the permission to use the velocipede in going to his work did not make the company's obligation to the deceased greater than it would have been after he got there.—C. & O. v. Nixon. Decided May 24, 1926. Opinion by Mr. Justice Holmes.

Railroad's Liability As Garnishee

An interstate shipment of apples consigned to shipper's order "Notify L." was placed on a track for unloading freight at destination where L., after surrendering the bill of lading, paying the freight charges and giving the railroad his receipt for the apples, commenced unloading the car. The same day a writ of garnishment was served against the railroad. The company, however, did not prevent L. completing the unloading.

The Supreme Court of the United States, reversing a judgment of the Supreme Court of Michigan (229 Mich. 468) which held the carrier liable as garnishee on the ground that under the interpretation of Section 5 of the uniform bill of lading the railroad had the custody, control and possession of the apples holds that the railroad was not liable thereunder, there being nothing in the law, nor in the bill of lading which could be construed as either conferring or denying the right of garnishment. "Section 5 of the bill of lading clearly does not authorize a carrier, who had surrendered to the consignee control of the shipment upon surrender of the bill of lading, payment of charges and signing of the usual receipt, any right to recapture control of the undischarged part of the shipment in the event that garnishee proceedings are commenced within 48 hours after such surrender."

Whether under the law of Michigan the railway was liable as garnishee, the court said it had no occasion to enquire.—Chicago & N. W. v. Alvin R. Durham Co. Decided May 24, 1926. Opinion by Mr. Justice Brandeis.

Equipment and Supplies

Locomotives

Illinois Central Orders 50 2-8-4 Type Locomotives

The Illinois Central has ordered 50 2-8-4 type locomotives from the Lima Locomotive Works. These are duplicates of the Lima A-1 locomotive and will have 28 in. by 30 in. cylinders, 63 in. diameter driving wheels, 240 lb. boiler pressure. They will have a booster-equipped four-wheel articulated trailer truck, which makes possible one hundred square feet of grate area. The approximate total weight of one of these engines in working order will be 385,000 lb. Inquiry for this equipment was reported in the *Railway Age* of May 15.

THE AL PACIFICO, Costa Rica, has ordered two consolidation type locomotives from the Baldwin Locomotive Works.

THE CHICAGO & NORTH WESTERN has ordered one 60-ton oil-electric locomotive from the American Locomotive Company, the General Electric Company and the Ingersoll-Rand Company.

THE CHICAGO, INDIANAPOLIS & LOUISVILLE has ordered six Mikado type locomotives from the American Locomotive Company. These locomotives will have 27-in. by 32-in. cylinders and a total weight in working order of 326,000 lbs. Inquiry for this equipment was reported in the *Railway Age* of February 27.

Freight Cars

THE GREAT NORTHERN is inquiring for 3,200 underframes for freight cars.

THE CARNEGIE STEEL COMPANY has ordered 8 Extension Side Dump cars from the Clark Car Company.

THE MICHIGAN ALKALI COMPANY has ordered 16 30-yd. air dump cars from the Western Wheel Scraper Company.

THE TENNESSEE CENTRAL has ordered 100 hopper cars, 100 gondola cars, 25 flat cars and 50 stock cars from the Pressed Steel Car Company.

THE BALTIMORE & OHIO has ordered 500 automobile box car bodies from the Standard Steel Car Company and 500 automobile box cars from the Bethlehem Steel Company.

THE PITTSBURGH TERMINAL COAL COMPANY has ordered 600 mine cars from the Irwin Mine Car Company and 200 mine cars from the Loraine Steel Company.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 200 underframes from the Bettendorf Company. Inquiry for this equipment was reported in the *Railway Age* of May 8.

THE DELAWARE, LACKAWANNA & WESTERN has ordered 300 box cars of 55 tons' capacity and 400 steel hopper cars of 70 tons' capacity from the American Car & Foundry Company, and 200 box cars of 55 tons' capacity from the Magor Car Corporation.

THE CENTRAL OF NEW JERSEY has ordered 400 steel box cars from the Bethlehem Steel Company, 400 steel box cars from the Standard Steel Car Company and 200 automobile box cars from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of May 22.

Passenger Cars

THE ST. LOUIS-SAN FRANCISCO has ordered 4 sixty-foot passenger and baggage gas-electric rail cars from the J. G. Brill Company, Philadelphia.

THE DELAWARE, LACKAWANNA & WESTERN has ordered two combination baggage and mail cars from the American Car & Foundry Company. Inquiry for this equipment was reported in the *Railway Age* of May 8.

Motor Vehicles

THE NEW ENGLAND TRANSPORTATION COMPANY, the bus subsidiary of the New York, New Haven & Hartford, has ordered 12 Mack buses from the International Motor Company.

Machinery and Tools

THE CHICAGO GREAT WESTERN is inquiring for four radial drills.

THE ATCHISON, TOPEKA & SANTA FE is inquiring for one 175-ton overhead crane.

THE DELAWARE & HUDSON has ordered two motor driven pipe machines from Manning, Maxwell & Moore, Inc.

THE BELT RAILWAY OF CHICAGO is inquiring for one blower, one 22-in. drill press, and one 16-in. by 8-ft. lathe.

THE CHICAGO, MILWAUKEE & ST. PAUL has ordered one Micro internal air brake pump grinder from Manning, Maxwell & Moore, Inc.

THE BOSTON & ALBANY has ordered a 2,500-lb. Chambersburg steam hammer, two 24-in. by 12-in. motor driven gear head lathes, two 20-in. by 11-in. motor driven gear head lathes and one 16-in. by 8-in. motor driven gear head lathe, from Manning, Maxwell & Moore, Inc.

THE SEABOARD AIR LINE has ordered a 200 to 400-ton Chambersburg combination mounting and demounting wheel press; two 44-in. Putnam vertical boring mills; one 30-in. by 14-in. gear head engine lathe and one 18-in. by 8-in. gear head engine lathe from Manning, Maxwell & Moore, Inc.

THE TEXAS & PACIFIC has ordered one 90-in. Putnam journal turning, quartering and pin turning machine; one Micro air brake pump internal grinder; 2 heavy motor driven floor grinders; one 32-in. heavy duty shaper; one 36-in. by 36-in. by 42-in. crank planer and one 20-in. by 10-in. crank planer from Manning, Maxwell & Moore, Inc.

Iron and Steel

THE NORFOLK & WESTERN is reported to be inquiring for 54,000 tons of rail.

THE NEW YORK, NEW HAVEN & HARTFORD is inquiring for 200 tons of steel for bridges.

THE CHICAGO, ROCK ISLAND & PACIFIC has ordered 200 tons of structural steel for a bridge in Joliet, Ill., from the American Bridge Company.

Signaling

THE ILLINOIS CENTRAL has ordered four locomotive equipments for the Union automatic train stop to be used on locomotives running between Waterloo, Ia., and Fort Dodge.

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company 13 Style S-8 electric units and a 24-lever frame, for addition to mechanical interlocking at Hanna, Ind.; also four units for Wanatah, Ind.

THE CLEVELAND, CINCINNATI, CHICAGO & ST. LOUIS has ordered from the Union Switch & Signal Company a 12-lever electro-mechanical interlocking machine frame, with nine working S-8 units, for "MC" junction, Middletown, Ohio.

THE NEW YORK CENTRAL has ordered from the Union Switch & Signal Company 90 searchlight signals, 465 relays and other apparatus for automatic block signaling on new third and fourth main tracks on the West Shore division between Weehawken, N. J., and West Englewood.

THE PENNSYLVANIA has ordered from the Union Switch & Signal Company ten Style "S-8" units and other material for additions at SK Tower, Canton, Ohio. Also, a Style "S-8" electro-mechanical machine for installation in conjunction with the existing mechanical interlocking at New Madison, Ohio.

Supply Trade News

D. A. Corey, vice-president of **S. F. Bowser & Co.,** Fort Wayne, Ind., has resigned.

The **Chicago Pneumatic Tool Company** will construct a two-story plant, 50 ft. by 260 ft., at Chicago.

The **American Hoist & Derrick Company** plans the construction of a one-story machine shop at St. Paul, Minn.

W. C. Lloyd has been appointed representative of the **Milwaukee Crane & Manufacturing Company,** with headquarters at Pittsburgh, Pa.

Loyall A. Osborne, president of the **Westinghouse Electric International Company,** was elected chairman of the National Industrial Conference Board at the tenth annual meeting of that organization in New York City.

The Trico Fuse Manufacturing Company, Milwaukee, Wis., has appointed **J. T. Sudduth & Co.,** Birmingham, Ala., as sales representatives for Alabama and Georgia. **The Coast Electric Supply Company,** Los Angeles, is also representative for the state of California.

A. G. Ripberger, formerly assistant general superintendent of operations of the **United Alloy Steel Corporation,** Canton, Ohio, has been appointed chief engineer, covering all divisions. Mr. Ripberger will be in charge of all phases of engineering and of the operation and maintenance of all power, steam and gas plants.

The business of the Graton & Knight Manufacturing Company, Worcester, Mass., has been transferred to the **Graton & Knight Company.** This involves no change in the management of the company, the reorganization comprising financial matters only. The officers of the company are: **Frank H. Willard,** president, **Frederick E. Barth,** vice-president, **Paul H. Wilson,** secretary and **Charles A. Bartlett,** treasurer.

Roscoe Seybold, formerly manager of price statistics of the **Westinghouse Electric & Manufacturing Company,** has been appointed assistant to F. A. Merrick, vice-president and general manager of the company. Mr. Seybold has been with the Westinghouse Company since 1907. He served in the price department and later was transferred to the sales department, where he was located for some years prior to his recent appointment as noted above.

Francis Hodgkinson, for many years chief engineer of the South Philadelphia Works, **Westinghouse Electric & Manufacturing Company,** has been appointed consulting mechanical engineer for the organization as a whole. The position of chief engineer of the South Philadelphia Works has been discontinued. **A. D. Hunt** has been appointed manager of engineering, a newly created position. He has for many years been a member of the engineering staffs of the Westinghouse organization.

G. R. S. Acquires Rights to Miller Train Control

The General Railway Signal Company of Rochester, N. Y., has acquired, under license, the right to make and sell, on a royalty basis, the automatic train control systems and train-stop devices of the Miller Train Control Corporation in the United States and Canada, under its patents, with the exception that the Miller Company, which is to maintain its own integrity, has reserved for itself its contracts with the Chicago & Eastern Illinois, the Elgin, Joliet & Eastern and the New York Central (Toledo-Detroit division) on which its installations are already in service, and has also reserved the territory of the states of Washington, Oregon, Idaho, Nevada, Arizona and California.

The General Railway Signal Company as is known, has contracts for installations of its systems on 22 divisions of 14 roads. The Miller Train Control Corporation made its first installation on the Chicago & Eastern Illinois in 1911 and has developed many desirable features, some of which are generic in character. The brake-applying device, which was given its first public demonstration in October, 1911, has been in continuous service ever since and is used in the company's latest installation of the inductive system on the New York Central. A full engine division of the Chicago & Eastern Illinois has been in regular service since 1914; 107 miles, 134 engines. This installation, of the ramp type, was approved by the Interstate Commerce Commission in March, 1925. Recently the company has developed an intermittent induction system, which operates with locomotive apparatus only slightly modified from that used in connection with the ramp system. In the spring of 1925 the company received an order from the New York Central for the equipment of 29 miles of its Toledo-Detroit division with the new inductive system; and announcement has just been made that it has been ordered to complete the entire division, 58 miles, including some multiple track. This installation was the subject of an illustrated article in the *Railway Age* of May 8, 1926.

Locomotives Built in May

May shipments of railroad locomotives, from the principal manufacturing plants, based on reports received by the Department of Commerce, totaled 140 locomotives, as compared with 151 in April and 101 in May, 1925. The following table gives the shipments and unfilled orders of locomotives for each month since January, 1925.

Year and Month	Shipments					Unfilled orders, end of month				
		Domestic		Foreign			Domestic		Foreign	
	Total	Steam	Electric	Steam	Electric	Total	Steam	Electric	Steam	Electric
1925										
January	98	41	12	43	2	414	322	44	33	15
February	88	69	7	9	3	414	318	51	33	12
March	117	88	13	14	2	461	324	51	71	15
April	101	72	14	9	0	490	343	41	77	29
May	101	65	9	25	2	478	324	48	75	31
Total (5 months)	505	341	55	100	9	..	..	..	..	..
June	114	58	8	42	6	411	274	47	65	25
July	76	56	12	4	4	386	259	39	65	23
August	118	91	6	13	8	334	199	48	72	15
September	100	42	16	34	8	390	278	41	64	7
October	93	47	21	24	1	530	386	40	92	12
November	106	52	8	46	0	585	435	46	64	40
December	104	68	18	14	4	708	557	54	56	41
Total	1,216	755	144	277	40	..	..	..	..	..
1926										
January	121	96	11	14	0	653	506	53	52	42
February	163	101	22	38	2	572	442	60	30	40
March	162	146	11	4	1	780	635	50	54	41
April	151	122	12	1	16	713	580	44	60	29
May	140	105	14	12	9	726	585	46	72	23
Total (5 months)	737	570	70	69	28	..	..	..	..	..

Obituary

Samuel H. Dannatt, manager of the New York office of the Electric Service Supplies Company, Philadelphia, Pa., died at his home in Mount Vernon, N. Y., on May 30, at the age of 43.

Trade Publications

THREE-CYLINDER LOCOMOTIVES.—The American Locomotive Company, 30 Church street, New York, has issued Bulletin No. 2003 illustrating and giving the principal dimensions, weights and proportions of a number of Alco three-cylinder locomotives, among which are the Union Pacific and Overland types built for the Union Pacific, the Southern Pacific type built for the Southern Pacific, the Lehigh Valley type built for the Lehigh Valley, and the Mohawk type built for the New York Central Lines. The bulletin also contains the paper on the Alco three-cylinder locomotive by J. G. Blunt, read before the Chicago section of the American Society of Mechanical Engineers.

Railway Construction

ATCHISON, TOPEKA & SANTA FE.—Plans have been agreed upon by the Kansas Highway Commission and the railroad for the elimination of a grade crossing by the construction of a subway at Wellington, Kan.

ATLANTIC COAST LINE.—This company contemplates the construction of stations at Tice, Fla., and at Naples, Fla.

BALTIMORE & OHIO.—This company has awarded a contract to the Vang Construction Company, Cumberland, Md., for making bridge and channel changes at Dock Siding, Ill.; estimated cost, $45,000.

BOSTON & MAINE.—A program has been adopted calling for the ballasting of 35½ miles of the road, double track, between Boston and Portland this summer; 15 miles on the southern division and 23 miles on the Fitchburg division; total 73½ miles of road, double track. The ballast will, in most cases, raise the road bed about 12 in. and the probable cost is $800,000 or more. It is planned to complete the stone ballasting of the entire western division, between Boston and Portland, within three years.

CENTRAL OF GEORGIA.—This company contemplates the construction of a station at Fort Benning, Ga.

CHICAGO & NORTH WESTERN.—Contracts have been placed with the Chicago Bridge & Iron Company, for the construction of water treating plants ranging from 12,500 to 35,000 gallons per hour capacity, at Chadron, Neb., New Ulm, Minn., South Pekin, Ill., and New Butler, Wis.

CHICAGO & NORTH WESTERN.—A contract has been awarded to the Chicago Bridge & Iron Company for the construction of five water treating plants as follows: Salem, 50,000-gal. capacity, Marshalltown, Iowa, 75,000-gal. capacity, Fremont, Neb., 125,000-gal. capacity, Nelson, Ill., 150,000-gal. capacity and Huron S. D., 50,000-gal. capacity.

CHICAGO & WESTERN INDIANA.—This company has given a contract to the McClintic-Marshall Company for 650 tons of structural steel for highway crossing work.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—Bids will be closed on June 15 for the construction of a 1-story Bedford stone passenger station at Bedford, Ky.

CHICAGO, ROCK ISLAND & PACIFIC.—Plans are being prepared for the construction of a one-story shop building at Burr Oak (Chicago), Ill.

LOS ANGELES UNION STATION.—A hearing to show why the Southern Pacific, the Union Pacific, the Atchison, Topeka & Santa Fe and the Pacific Electric should not join in the construction of a union station at Los Angeles will be held by the California Railroad Commission on August 2.

MISSOURI-KANSAS-TEXAS.—Plans have been agreed upon by the Kansas Highway Commission and the railroad for the construction of a subway at Chetopa, Kan.

MISSOURI PACIFIC.—A contract has been awarded to the Virginia Bridge & Iron Company for the construction of a bridge at Kragen, Ark., to cost approximately $63,000.

MORRIS & ESSEX.—This company, which is leased by the Delaware, Lackawanna & Western, has applied to the Interstate Commerce Commission for authority to build a four-track extension of 0.676 miles to connect with a new freight yard at Jersey City, N. J.

NEW YORK CENTRAL.—This company has awarded a contract to the P. T. Cox Contracting Company, Inc., New York City, for the construction of north abutment, including wing wall at W. 137th street, New York City, to cost approximately $95,000. A contract has been awarded to the Morgan Engineering Company, New York City, for the manufacture, delivery and erection of a 20-ton electric traveling crane at Rochester, N. Y., to cost approximately $33,500. A contract has also been awarded to the Walsh Construction Company, Davenport, Ia., for grading for third track from Voorheesville, N. Y., to South Schenectady, N. Y., to cost approximately $975,000.

NEW YORK, NEW HAVEN & HARTFORD.—This company has authorized the construction, by company forces, of an extension (34 ft.) of nine stalls in the present engine house at Cedar Hill, New Haven, Conn., to accommodate heavy power. The approximate cost is $80,000. This supersedes previous information reported in the *Railway Age* of May 15 that a 10-stall extension would be constructed, to cost approximately $97,000.

NORFOLK & WESTERN.—This company has awarded contracts to J. P. Pettyjohn & Co., Lynchburg, Va., for a motive power office at Williamson, W. Va., and for foundation work for engine pits and a roundhouse at the same point, the former to cost approximately $45,000 and the latter approximately $75,000.

NORTHERN PACIFIC.—New freight handling facilities will be constructed at Spokane, Wash., as part of the development of a new industrial site in that city. The buildings will include a 67-ft. by 80-ft. office building; a 67-ft. by 280-ft. inbound freight house and an 18-ft. by 700-ft. covered platform for outbound freight.

OREGON SHORT LINE.—This company has awarded a contract to the Virginia Bridge & Iron Company for the construction of a bridge at Ogden, Utah, to cost approximately $26,000.

ST. LOUIS-SAN FRANCISCO.—Indorsement of the proposal of this company to build a line from Aberdeen, Miss., to Kimbrough, Ala., to connect with the Muscle Shoals, Birmingham and Pensacola has been given by the Alabama Public Service Commission. An application for the construction of this line is now before the Interstate Commerce Commission.

SOUTHERN.—This company closed bids on June 11 for a 1,000-ton capacity reinforced concrete coaling station at Chattanooga, Tenn.

SOUTHERN.—A contract has been awarded to the Virginia Bridge & Iron Company for the construction of a car repair shed at Knoxville, Tenn., to cost approximately $31,000.

SOUTHERN PACIFIC.—The line from Truckee, Cal., to Lake Tahoe is being broad-gaged at a cost of $180,000, while improvements are being made to the company's property on Lake Tahoe at an estimated cost of $75,000.

THE TERMINAL RAILROAD ASSOCIATION OF ST. LOUIS.—This company contemplates the construction of a car repair shop to cost approximately $50,000 with equipment.

WABASH.—This company is asking for bids for the construction of a 2-story brick office and mill building, 34 ft. by 188 ft., at Oakwood, Mich.

PRUNES COST MORE THAN LOCOMOTIVES.—While still less costly than prunes and not half so expensive as butter, the price of locomotives has increased more than ten cents a pound since 1915, according to J. H. Dyer, general manager of the Southern Pacific. The company last year paid an average price of 17.3 cents a pound for 11,218,600 lb. of locomotives, as compared with an average of 7.09 cents in 1915. Public interest has occupied itself largely with the advancing cost of living. Few people, however, are aware, says Mr. Dyer, of the fact that during ten years in which foodstuffs advanced 46 per cent, the cost of locomotives advanced 140 per cent. The Pacific type locomotive that in 1915 cost $25,585 now costs approximately $75,000. "Other costs of railway equipment and operation have increased proportionately. Meanwhile railway income, restricted by legislation, has shown no increase corresponding with either the mounting cost of living or the swollen expense of railroad operation. The company's gross freight revenue since 1914 has increased only 24.5 per cent per ton mile, and passenger revenue 28.2 per cent per passenger mile. In view of the high cost of railroad living only the increased efficiency of railroad administration and operation enables the carriers to do business at even a slight profit."

Railway Financial News

AKRON, CANTON & YOUNGSTOWN.—*Application.*—This company has applied to the Interstate Commerce Commission for authority to guarantee $200,000 of 4½ per cent equipment trust certificates to be delivered, together with $52,105 cash, in payment of four locomotives purchased. The issue will be dated June 1, 1926, and will mature in serial installments from June 1, 1927, to June 1, 1941.

ATCHISON, TOPEKA & SANTA FE.—*Acquisition.*—The Interstate Commerce Commission has assigned this company's application for authority to acquire control of the New Mexico Central for hearing on June 23 at Washington before Assistant Director Burnside, of the Bureau of Finance.

ATLANTA, BIRMINGHAM & ATLANTIC.—*Reorganization.*—The projected reorganization of this company and its acquisition by the Atlantic Coast Line of control of the road will be the subject of final argument on July 14, at Washington, before the Interstate Commerce Commission, Division 4.

BUFFALO & SUSQUEHANNA.—*Guaranty.*—The Interstate Commerce Commission has certified to the Secretary of the Treasury that it has fixed the guaranty of the Buffalo & Susquehanna Railroad under Section 209 of the Transportation Act at $78,250 and that $21,749 is due from the carrier on account of overpayment.

CHICAGO & NORTH WESTERN.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to procure authentication and delivery of $14,000,000 of first and refunding mortgage bonds, to reimburse its treasury in part for capital expenditures from August 1, 1923, to December 31, 1925.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—*Bonds.*—This company has applied to the Interstate Commerce Commission for authority to issue nominally $855,000 of first and general mortgage 6 per cent bonds to be pledged from time to time as security for short term notes.

CHICAGO, INDIANAPOLIS & LOUISVILLE.—*Bonds Sold.*—Potter & Co. and Harris, Forbes & Co., have sold at 98 and accrued interest to yield about 5⅛ per cent $1,000,000 first and general mortgage 5 per cent bonds Series A. The bonds mature May 1, 1966, and are non-redeemable. The first and general mortgage bonds are secured on the entire property of the company subjct to $16,903,000 closed prior lien bonds. The authorized issue of first and general mortgage bonds is $40,000,000. Including Series B there will be $8,261,000 bonds outstanding in the hands of the public. Of the unissued bonds $16,172,000 are reserved to retire underlying liens and the balance may be issued for only 80 per cent of the cash cost of additions, improvements and acquisitions.

DEUTSCHE REICHSBAHN.—*Preferred Stock Issue.*—Jerome B. Sullivan & Co., 42 Broadway, New York, have offered at 95½ 150,000,000 gold marks 7 per cent preferred stock, series 4, of the Deutsche Reichsbahn or German Railways Company, in denominations of 200, 500, 1,000 and 10,000 Reichsmarks. Details of the issue are given as follows:

The German Railways Company, organized by the Dawes Commission, is the largest railroad system in the world, comprising 33,000 miles of track, and employs more than 700,000 men.

Rm. 881,000,000 preferred stock to be presently outstanding is followed by Rm. 13,000,000,000 common stock owned by the German Government. Prior obligations consist of Rm. 11,000,000,000 5 per cent bonds held in trust for the Allied Governments, and an obligation imposed by the Dawes Commission to set aside annually out of the gross income a reserve of 2 per cent until this fund totals Rm. 500,000,000.

Earnings for the past year have been satisfactory. It is expected that the earnings of future years will compare very favorably with those of prewar years, which showed an average annual surplus of one billion marks after the deduction of operating expenses and taxes. About one-half of this annual surplus is required to pay interest on the bonded debt.

If a dividend is declared out of surplus earnings on the common stock, the preferred stock shall be entitled to an extra dividend equivalent to one-third of such surplus earnings. Dividends subject to 10 per cent German income tax, but the company agrees to bear any future tax levies over 10 per cent.

This issue is non-redeemable until 1942. Redeemable from 1942 to 1949 at 120 per cent; 1949 to 1959 at 110 per cent; and thereafter at 100 per cent.

The proceeds of this issue are to provide funds for additions to the existing property.

Dividends are guaranteed by the German government.

EAST JORDAN & SOUTHERN.—*Valuation.*—The Interstate Commerce Commission has found the final value for rate-making purposes to be $401,738 as of 1918.

FAIRCHILD & NORTHEASTERN.—*Abandonment.*—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon as to interstate and foreign commerce its entire line which extends from Cleghorn, Wis., to Owen, 65 miles. The road was built to serve lumber operations which have now practically ceased. The territory is served by lines of the Minneapolis, St. Paul & Sault Ste. Marie and the Chicago, St. Paul, Minneapolis & Omaha. The commission sustained the view of the Railroad Commission of Wisconsin that the Interstate Commerce Commission had no jurisdiction to authorize the abandonment as to intrastate commerce of any portion of the carrier's line, since its entire railroad is located wholly within a single state.

GREAT NORTHERN.—*Security Issue Postponed.*—The Interstate Commerce Commission has issued an order at the request of the Great Northern vacating another of January 26 last, which authorized the company to issue $5,000,000 of general mortgage 5 per cent bonds, to be dated January 1, 1923, and to mature January 1, 1973. The Great Northern advised the commission that it did regard the proposed issue of securities as desirable at the present time.

LIVE OAK, PERRY & GULF.—*Valuation.*—The Interstate Commerce Commission has found the final value for rate-making purposes to be $693,900 as of 1917.

MARION & EASTERN.—*Purchase.*—The Illinois Commerce Commission on June 2 authorized the Missouri Pacific to purchase all of this company's outstanding capital stock for $190,000.

MIDDLE CREEK.—*Acquisition of Extension.*—This company has applied to the Interstate Commerce Commission for authority to acquire and operate under a 10-year lease a line extending from Hartland to Bickmore, 4.2 miles in Clay county, W. Va., and a right-of-way extending beyond Bickmore to Greendale. The carrier states that the present owners of the property in question cannot continue operation and that operation should be continued to serve several mines producing a large tonnage of coal.

MOBILE & GULF.—*Purchase of Line.*—Application has been made to the Interstate Commerce Commission to issue $300,000 of capital stock to be used for the purchase of a logging road extending from Fayette, Fayette county, to Buhl, Tuscaloosa county, Ala., a distance of 30 miles, and to construct an extension of 3.5 miles. The road is not now operated as a common carrier and is owned by the W. P. Brown & Sons Lumber Company. It is the intention of the applicant to deliver to the lumber company $295,000 par of the proposed issue of capital stock.

NEW YORK CENTRAL.—$500,000,000 *Capital—Leases of Subsidiaries.*—The directors on June 9 recommended that the New York Central's authorized capital stock be increased from $400,000,000 to $500,000,000 and that five subsidiary lines, now controlled through stock ownership, be leased. The company now has $383,253,340 stock outstanding. A special meeting of the stockholders has been called for September 29 to pass on these recommendations of the directors, which include also a proposal that the directors be authorized to offer, from time to time, to employees of the company or of subsidiary lines, New York Central stock for subscription in amounts not more than $20,000,000 in the aggregate.

The proposed leases, involving the Michigan Central, Cleveland, Cincinnati, Chicago & St. Louis (Big Four), the Cincinnati Northern, the Chicago, Kalamazoo & Saginaw and the Evansville, Indianapolis & Terre Haute, represent the first important recent step of the New York Central to bring its subsidiary lines into closer union.

At the same time the Michigan Central, 99 per cent of the stock of which is owned by the New York Central, declared a semi-annual dividend of 17½ per cent, thereby raising the annual rate of payment from 20 per cent to 35 per cent.

The New York Central recently increased its holdings of Michigan Central by public offer of $1,000 a share for the few outstanding minority shares.

The lease proposals, each for 99 years, are as follows:

1. Lease of the Michigan Central at an annual rental which includes a dividend on Michigan Central stock pledged as collateral for the New York Central-Michigan Central 3¼ per cent collateral bonds in compliance with

the indenture under which they were created, and an amount equal to 50 per cent on such stock as is not owned by the New York Central.

2. Lease of the Chicago, Kalamazoo & Saginaw to the New York Central. The stock of this road is held by the Central and the Michigan Central.

3. Lease of the Cleveland, Cincinnati, Chicago & St. Louis at an annual rental which includes an amount equal to 5 per cent on the preferred and 10 per cent on the common stock not owned by the New York Central.

4. Lease of the Cincinnati Northern Railroad to the Cleveland, Cincinnati, Chicago & St. Louis at an annual rental which includes an amount equal to 12 per cent on such stock as is not owned by the New York Central.

5. Lease of the Evansville, Indianapolis & Terre Haute to the Cleveland, Cincinnati, Chicago & St. Louis, all of the stock being owned by the lessee. This leasehold would be transferred to the New York Central.

The New York Central at the present time owns more than 99 per cent of the stock of the Michigan Central and more than 84 per cent of the preferred and 91 per cent of the common stock of the Cleveland, Cincinnati, Chicago & St. Louis. The "Big Four," in turn, owns more than 97 per cent of the stock of the Cincinnati Northern.

Meetings of the stockholders of the several companies have been called for dates in September to ratify the leases, and applications will be made in due course to the Interstate Commerce Commission for the latter's approval.

No announcement was made regarding the Pittsburgh & Lake Erie, of which the New York Central owns a majority of the capital stock or of the Rutland, which the New York Central controls jointly with the New Haven.

NEW YORK, CHICAGO & ST. LOUIS.—*New Merger Plan Rumored.*—Persistent rumors in New York are to the effect that the Van Sweringens will soon make an announcement with regard to details of a modified plan for the proposed Nickel Plate Railroad consolidation, which plan has been altered to meet the objections of the Interstate Commerce Commission.

NORFOLK & WESTERN.—*Virginian Lease.*—The application to acquire control of the Virginian has been assigned for argument before Division 3 of the Interstate Commerce Commission on July 8.

SARATOGA & ENCAMPMENT.—*Abandonment.*—Abandonment of the Saratoga & Encampment as to interstate and foreign commerce was authorized by the Interstate Commerce Commission by an order issued on June 9. The line extends from a connection with the Union Pacific at Walcott to Encampment, Carbon county, Wyo., a distance of 44.77 miles. The property is owned by the Morse Brothers Machinery & Supply Company which, under the commission's order, is directed to sell the line, or any portion of it, at its net fair junk value to any one desiring to purchase it within the next 120 days. The proceeding with respect to abandonment of the road has been pending since 1921. In 1921 the Union Pacific agreed to operate the line for a period of three years, with the option to purchase it. The Union Pacific did not purchase the line, however, and ceased operating it Oct. 31, 1924. Since that time the road has been operated by a receiver.

SAVANNAH & ATLANTA.—*Security Issue.*—Charles E. Gay, Jr., receiver, has been authorized by the Interstate Commerce Commission to issue $500,000 of 7 per cent receivers' certificates to retire an outstanding note for $150,000 and to make improvements on its line.

SPOKANE INTERNATIONAL.—*Valuation.*—The Interstate Commerce Commission has found the final value for rate-making purposes to be $4,860,121 as of 1917.

ST. LOUIS & O'FALLON.—*Excess Operating Expenses.*—The Interstate Commerce Commission, which recently made public a proposed report by Examiner Kelley recommending findings as to the excess income of this company and the Manufacturers' Railway under section 15a of the Interstate Commerce act, has issued an order re-opening the proceedings for further hearing before Examiner Kelley at Washington on June 21 "on the question of excess operating expenses during the year 1923." Oral argument before the commission on the proposed report has been set for July 1 and 2.

TEXAS & NEW ORLEANS.—*Abandonment of Branch.*—The Interstate Commerce Commission has issued a certificate authorizing this company to abandon its branch from a connection with the Beaumont-Dallas line at Rockland, Tex., to Turpentine, 10.5 miles, which was built to serve lumber operations.

UNADILLA VALLEY.—*Valuation.*—The Interstate Commerce Commission has found the final value for rate-making purposes to be $316,000 as of 1918.

WILLIAMSPORT & NORTH BRANCH.—*Valuation.*—The Interstate Commerce Commission has found the final value for rate-making purposes to be $1,001,600 as of 1917.

Chicago, Milwaukee & St. Paul Receivership Hearings Close at Chicago

Hearings before the Interstate Commerce Commission on the receivership of the Chicago, Milwaukee & St. Paul, which have been held at Chicago during the past two weeks were closed on June 5. At the final session, Commissioner Cox indicated that while there was a possibility of further hearings in Chicago later in the month or in July, it was probable that the next hearing would be held in Washington about the first of July. At that time attorneys for the railroad are expected to present evidence in rebuttal to exhibits submitted previously by the government dealing with alleged discrepancies in the St. Paul's accounts.

Attorneys for the commission, assisted by counsel for the state of Wisconsin and for bondholders have endeavored to substantiate charges of conspiracy and mismanagement in connection with the acquisition of the Chicago, Terre Haute & Southeastern and the Chicago, Milwaukee & Gary by the St. Paul; also in the St. Paul's coal contracts and the accounts of the road covering both activities. The commission seeks to secure information relating to the construction and subsequent electrification of the Puget Sound extension. The collection of this information is expected to be completed by September, at which time hearings will be conducted in Seattle, Wash.

Average Price of Stocks and Bonds

	June 8	Last Week	Last Year
Average price of 20 representative railway stocks	93.17	91.99	79.15
Average price of 20 representative railway bonds	96.43	96.18	91.36

Dividends Declared

Lake Erie & Eastern.—Initial, 2 per cent, payable July 1 to holders of record June 24.

Mohawk Valley.—$.50, quarterly, payable July 1 to holders of record June 21.

Pere Marquette.—Common, 1¾ per cent, quarterly, payable July 1 to holders of record June 15. Prior preferred, 1¾ per cent, quarterly; preferred, 1¾ per cent, quarterly, both payable August 2 to holders of record July 15.

St. Louis, Rocky Mountain & Pacific.—Common, ½ per cent, quarterly; preferred, 1¾ per cent, quarterly, both payable June 30 to holders of record June 15.

Cleveland, Cincinnati, Chicago & St. Louis has declared regular quarterly dividends of $1.75 on common and $1.25 on preferred, both payable July 20 to stock of record June 25.

Canada Southern has declared regular quarterly dividend of 1½ per cent, payable August 2 to stock of record July 25.

Cincinnati Northern has declared a dividend of 5 per cent, payable July 20 to stock of record July 13. The last previous dividend was 5 per cent, paid January 20 this year.

Detroit River Tunnel has declared regular quarterly dividend of 3 per cent, payable July 15 to stock of record July 8.

Michigan Central has declared a semi-annual dividend of $17.50, payable July 29 to stock of record June 25. This places the stock on an annual basis of 35 per cent. The last previous dividend was 7½ per cent extra and 10 per cent semi-annual, paid January 29, 1926.

New York Central has declared regular quarterly dividend of $1.75, payable August 2 to stock of record June 25.

Pittsburgh & Lake Erie has declared regular quarterly dividend of $2.50, payable August 2 to stock of record July 16.

Toronto, Hamilton & Buffalo has declared a semi-annual dividend of 3 per cent, payable July 1 to stock of record June 24. On December 31, 1925, the company paid a stock dividend of 20 per cent and cash dividend of 6 per cent.

Valuation Reports

The Interstate Commerce Commission has served final or tentative valuation reports, finding final value for rate-making purposes of the property owned and used for common-carrier purposes as of the respective valuation dates as follows:

FINAL REPORTS		
Alabama, Florida & Gulf	$195,810	1918
Central Transfer Railway & Storage Co. (owned, but used by other carriers)	24,500	1917
Intermountain	991,127	1916
Tooele Valley	235,489	1915
TENTATIVE REPORTS		
Atlantic & Carolina	$70,500	1917
Buffalo Creek	77,110	1917
Colorado & Wyoming	3,287,000	1918
Detroit & Mackinac	6,559,700	1917
Ironton	396,000	1917
Midland Continental	1,110,050	1917
Wabash, Chester & Western	886,100	1917

Railway Officers

Executive

P. T. Hubbell has been elected vice-president of the Waco, Beaumont, Trinity & Sabine, with headquarters at Houston, Tex.

Operating

S. L. Clayton has been appointed division examiner of the Southern Pacific, with headquarters at Dunsmuir, Cal.

William A. Aiken, Jr., who has been appointed superintendent of transportation of the Richmond, Fredericksburg & Potomac, with headquarters at Richmond, Va., was born on May 8, 1882, at Norfolk, Va., and was educated at the Richmond High School. He entered railway service on October 1, 1900, in the traffic department of the Richmond, Fredericksburg & Potomac, where he remained until 1902. From 1902 to 1906, he was secretary to the assistant general manager of the same road, and from 1906 to 1910, was chief clerk to the general superintendent. Mr. Aiken then became chief clerk to the superintendent of transportation, which position he held until 1920. He was then appointed assistant to the superintendent of transportaion, which position he was holding at the time of his recent appointment as superintendent of transportation.

W. A. Aiken, Jr.

P. L. Gaddis has been appointed superintendent of the Southern division of the Florida East Coast, with headquarters at Miami, Fla., to succeed **E. P. McLain,** resigned. Mr. Gaddis was born at Jasper, Ga., and was educated in the public schools. He entered the service of the Marietta & Georgia (now a part of the Louisville & Nashville) in 1900, and from 1902 to 1904 served as telegraph operator on that road and as agent-operator on the Florida East Coast. In 1905 he became chief operator of the Jacksonville Terminal Company, and subsequently served as chief operator and station master for the Atlanta Terminal Company, until 1910. He held various positions with the National Railways of Mexico until 1915, and from that year until the time of his recent promotion, was consecutively dispatcher, chief dispatcher, trainmaster, assistant superintendent and transportation inspector on the Florida East Coast.

P. L. Gaddis

E. W. Cameron, assistant superintendent of the Canadian National Railways, with headquarters at Neetawa, Man., has been transferred to the Regina division, with headquarters at Moose Jaw, Sask.

George H. Sido, superintendent of transportation of the Wabash, with headquarters at St. Louis, Mo., has resigned to become general superintendent of the Ann Arbor, with headquarters at Toledo, Ohio, and will be succeeded by **Fred Meyers,** assistant superintendent of transportation. The office of assistant superintendent of transportation has been abolished.

Traffic

Edward Hoffman has been appointed general agent of the New York Central, with headquarters at Cleveland, Ohio, to succeed **L. M. Souders,** resigned.

Robert M. Rogers has been appointed traffic manager of the Green Bay & Western, the Kewaunee, Green Bay & Western, and the Ahnapee & Western, with headquarters at Green Bay, Wis.

Walter L. Meyers, division freight and passenger agent of the Missouri-Kansas-Texas, with headquarters at Galveston, Tex., has been transferred to Atlanta, Ga., and will be succeeded by **J. E. Scott,** soliciting freight agent, with headquarters at Dallas, Tex.

J. Hattendorf, general freight agent of the Yazoo & Mississippi Valley, with headquarters at Memphis, Tenn., has been promoted to assistant freight traffic manager, with the same headquarters and will be succeeded by **J. L. Sheppard,** assistant general freight agent, with the same headquarters.

E. F. Fleming, general agent, freight department, of the Chicago, Burlington & Quincy, with headquarters at Chicago, has been appointed general freight agent (solicitation), a newly created position and will be succeeded by **H. A. Pence,** division freight agent, with headquarters at Burlington, Iowa, who in turn will be replaced by **I. E. Appleton,** assistant general agent, with headquarters at Chicago, who will be succeeded by **H. F. Koenig,** city freight agent, with headquarters at Chicago.

C. H. Pumphrey, assistant general freight agent of the Baltimore & Ohio, with headquarters at Louisville, Ky., has been promoted to assistant to vice-president, with headquarters at Baltimore, Md. **L. C. Smith,** district freight representative, with headquarters at Memphis, Tenn., has been appointed division freight agent, with headquarters at Louisville, Ky., and the positions of assistant general freight agent and district freight agent have been abolished. **T. O. Pinaire,** district freight agent, with headquarters at Louisville, Ky., will succeed Mr. Smith as district freight representative, with headquarters at Memphis, Tenn. **D. E. Sullivan,** division freight agent, with headquarters at Garrett, Ind., has been promoted to assistant to the general freight agent, with headquarters at Chicago, and will be succeeded by **C. M. Groninger,** division freight agent, with headquarters at Springfield, Ill. **E. N. Kendall,** division freight agent, with headquarters at Newark, Ohio, has been granted a leave of absence on account of ill health, and will be succeeded by **W. S. Bollman,** division freight agent, with headquarters at Chillicothe, Ohio, who in turn will be succeeded by **A. S. Baker,** chief clerk to the vice-president, with headquarters at Baltimore, Md. **E. C. Law,** district freight agent, with headquarters at Toledo, Ohio, has been granted a leave of absence on account of ill health and will be succeeded by **M. N. Freese,** district freight agent, with headquarters at Columbus, Ohio, who in turn will be succeeded by **C. P. Bauchens,** district freight agent, with headquarters at St. Louis, Mo. Mr. Bauchens will be succeeded by **L. W. Land,** district freight representative, with headquarters at Tulsa, Okla.

Charles H. Mathews, Jr., general passenger agent of the Pennsylvania, with headquarters at Pittsburgh, Pa., has been transferred in the same capacity to Philadelphia, succeeding **O. T. Boyd,** who died on May 29. **William Pedrick, Jr.,** gen-

eral eastern passenger agent at New York, has been appointed general passenger agent, with the same headquarters, a newly created position. **Henry Opperman, Jr.,** district passenger representative at New York, has been appointed foreign passenger agent, with the same headquarters, a newly created position. An additional position of general freight agent at Chicago has been created and **R. W. Cooke,** assistant general freight agent at Chicago has been assigned to the place. **F. McD. Quinn,** assistant general passenger agent at Pittsburgh, has been appointed general passenger agent, with the same headquarters, succeeding Mr. Mathews. **R. M. Flocker,** division passenger agent at Pittsburgh, has been appointed assistant general passenger agent at that city, succeeding Mr. Quinn, and **F. E. Lowe,** chief clerk in the passenger department at Pittsburgh, has been promoted to division passenger agent to succeed Mr. Flocker. **F. W. Nash,** assistant general freight agent at St. Louis, has succeeded Mr. Cooke as assistant general freight agent at Chicago. **C. E. Clapp,** division freight agent at Chicago, has been appointed assistant general freight agent at St. Louis, to succeed Mr. Nash. **George A. Hill,** division freight agent at Detroit, Mich., has succeeded Mr. Clapp as division freight agent at Chicago. **R. H. Miller,** district freight representative at Pittsburgh, has been appointed division freight agent at Detroit, succeeding Mr. Hill, and **N. F. Carter,** district freight agent at Charlotte, N. C., has succeeded Mr. Miller at Pittsburgh. **T. A. McMillen,** chief clerk to the traffic manager at Chicago, has been appointed division freight agent at Grand Rapids, Mich., succeeding **H. R. Griswold,** who died recently. **W. J. Baar,** district freight representative at Seattle, Wash., has been appointed division freight agent at Fort Wayne, Ind., succeeding **W. B. Hopkins,** who has become assistant general freight agent on the Long Island, at New York, and **C. B. Brodie,** division passenger agent at New York, has been appointed general eastern passenger agent, with the same headquarters, succeeding Mr. Pedrick. These appointments are all effective June 15.

Mechanical

G. A. Miller, who was superintendent motive power and machinery of the Florida East Coast, with headquarters at St. Augustine, Fla., and who recently made application for retirement, has been assigned to special duties relating to the completion of the Miller shops at St. Augustine, with the title of superintendent motive power and machinery, retired, pending formal retirement.

Engineering, Maintenance of Way and Signaling

W. T. Covert, who has been appointed chief engineer, maintenance of way, of the Eastern region of the Pennsylvania, was born on January 4, 1873, at Philadelphia, Pa., and was graduated from the Pierce School of Business at Philadelphia, Pa., and from Cooper Institute, at New York. He entered railway service in May, 1890, as a clerk in the accounting department of the Pennsylvania, at Philadelphia, and until October 3, 1895, was rodman on the same road, and served in various capacities in connection with construction work under the engineer maintenance of way of the United Railroads of New Jersey. From the latter date until June, 1897, he was in the office of the principal assistant engineer of the Pennsylvania, at Altoona, Pa. He then became assistant supervisor of the Philadelphia division, at Paoli, which position he held until July, 1900. From July, 1900, until October 25, 1917, he was successfully supervisor on the Renovo division, supervisor of the Philadelphia yard, assistant engineer of the Chautauqua division, assistant engineer on the Eastern & Susquehanna division and division engineer on the Philadelphia Terminal division of the same road. On October 25, 1917, Mr. Covert was appointed principal assistant engineer of the Western Pennsylvania division at Pittsburgh, Pa., and on March 1, 1920, he became engineer maintenance of way of the Western Pennsylvania division, with headquarters at Pittsburgh, Pa., which position he was holding at the time of his recent appointment.

W. T. Covert

C. E. Weaver, engineer maintenance of way of the Central of Georgia, with headquarters at Savannah, Ga., has been promoted to chief engineer, with the same headquarters, succeeding **C. K. Lawrence,** who has retired.

B. F. Titus, heretofore with the General Railway Signal Company, has been appointed assistant engineer in the office of H. S. Balliet, engineer of train control, New York Central Lines; headquarters New York City.

Irving Anderson, division engineer on the Atchison, Topeka & Santa Fe, with headquarters at Marceline, Mo., has been transferred to the Kansas City division, with headquarters at Kansas City, Mo., the position of division engineer on the Kansas City division being a newly created one. **M. V. Holmes,** roadmaster, with headquarters at Ottawa, Kan., has been promoted to division engineer at Marceline in place of Mr. Anderson.

H. B. Knecht, division engineer of the Missouri Pacific, with headquarters at Coffeyville, Kan., has been transferred to the Arkansas division, with headquarters at Little Rock, Ark., succeeding **Joe Davis,** who has been promoted to assistant superintendent. **W. F. Murray,** assistant division engineer, with headquarters at Hoisington, Kan., has been transferred to Coffeyville in place of Mr. Knecht. **G. S. Smith** has been appointed assistant division engineer of the Colorado division in place of Mr. Murray.

Purchases and Stores

T. J. Frier has been appointed purchasing agent of the Ann Arbor and Manistique & Lake Superior, with headquarters at St. Louis, Mo., succeeding **C. Z. Hughes.**

J. E. Wharton has been appointed storekeeper of the newly organized maintenance of way storehouse of the Western region of the Pennsylvania, with headquarters at Logansport, Ind., following the closing of the maintenance of way stores at Chicago and Indianapolis, Ind. **H. W. Brant** has been appointed assistant storekeeper.

Obituary

S. D. Cooper, assistant manager of treating plants of the Atchison, Topeka & Santa Fe, and recently president of the American Wood Preservers' Association, died at Topeka, Kan., on June 9, after an extended illness.

John D. Spreckles, president of the San Diego & Arizona, died on June 7 at Coronado, Cal., from a complication of ailments. He was born on August 16, 1853, at Charleston, S. C., and was educated at Polytechnic College at Hanover, Germany. He has been president of the San Diego & Arizona since 1906. He was also president of the Pajoro Valley Consolidated Railroad and in 1922 was president of the San Diego Electric Railway and the Oceanic Steamship Company.

THE RAILWAY AND LOCOMOTIVE HISTORICAL SOCIETY, 6 Orkney Road, Brookline, Mass., has issued its eleventh historical bulletin. "Locomotive Builders of Paterson" (New Jersey) is the principal article in the pamphlet, illustrated by pictures of typical engines of the different makers. George Althouse, a locomotive runner who flourished in New York and Connecticut in the last century, is the subject of a sketch.